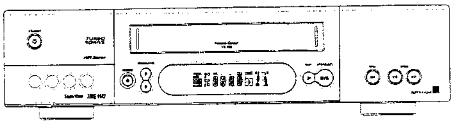
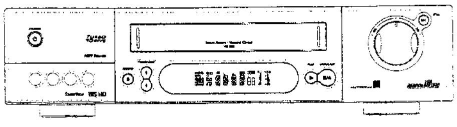
Video Cassette Recorder **Deck: Turbo Drive** **APOLLO 20**

Service
Service
Service

VR800/02/07/16/39/58
VR805/071/161/391
VR850/02/07/16/39/58





Service Manual

Evolution: AA

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Survey of versions:

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/07/071	PAL I, NICAM
/16/161	PAL B/G, NICAM & German Stereo
/39/391	PAL B/G & SECAM L, NICAM
/58	PAL B/G & SECAM BG/DK

Survey of remote controls:

VR800:	english:	RT188/101	4822 219 10561
	french (/39):	RT188/104	4822 219 10562
VR805:	english:	RT198/101	4822 219 10584
	french (/391):	RT198/104	4822 219 10583
VR850:	english:	RT587/101	4822 219 10563
·	french (/39):	RT587/104	4822 219 10564

Survey of tape decks:

VR800, VR805:	WDQ-S4/2	4 Video+ 2 FM-Audio heads
VR850:	WDQ-S4/2 S	4 Video+ 2 FM-Audio heads, Jog/Shuttle

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

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PCS 93695 GB

PHILIPS

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Features

Specification Items	VR800/02	VR800/07	VR800/16	VR800/39	VR800/58	VR805/071	VR805/161	VR805/391	VR850/02	VR850/07	VR850/16	VR850/39	VR850/58
Backup Clock	7hrs	7hrs	7hrs	7hrs	7hrs	7hrs	7hrs	7hrs	7hrs	7hrs	7hrs	7hrs	7hrs
Tuning - presets	99	99	99	99	99	99	99	99	99	99	99	99	99
Reception													
PAL B/G	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓
PAL I		✓		✓		✓		✓		✓		✓	
PAL D/K					✓								✓
SECAM L/L'				✓				✓				✓	
SECAM BG				✓	✓			✓				✓	✓
SECAM DK					✓								✓
German Stereo	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓
NICAM		✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
Rec/Pb PAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rec/Pb SECAM				✓				✓				✓	
Rec/Pb MESECAM				✓	✓			✓				✓	✓
NTSC Playback	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modulator	Pal G	Pal I	Pal G	-	Pal G/K	Pal I	Pal G	-	Pal G	Pal I	Pal G	-	Pal G/K
Auto Search	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓
Auto Install		✓				✓				✓			
Guide Channel Mapping	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Time/Date Download	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Microphone in									✓	✓	✓	✓	✓
Headphone Out									✓	✓	✓	✓	✓
Synchro edit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Auto Tape Length Recognition	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wind/Rew. Time (E180)	90s	90s	90s	90s	90s	90s	90s	90s	90s	90s	90s	90s	90s
VISS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Studio Picture Control	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Natural Colour	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Smart Picture									✓	✓	✓	✓	✓
VPS/PDC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ShowView	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓
VideoPLUS +		✓				✓				✓			
Rec.Prep. Mode Scart 1/2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Audio Dubbing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NexTView Link (pin 10)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

PCBs & Tape Decks

	POWER SUPPLY	MOTHER BOARD	NICAM BOARD	DISPLAY CONTROL		TAPE DECK	
page 3-	16	18-45	46	48	50		
	ASM1	AMB	QNIC (ANIC)	ADCP3	ACP3	WDQT-S4/2	WDQT-S4/2S
VR800/02	●	●		●	●	●	
VR800/07	●	●	●	●	●	●	
VR800/16	●	●	●	●	●	●	
VR800/39	●	●	●	●	●	●	
VR800/58	●	●	●	●	●	●	
VR805/071	●	●	●	●	●	●	
VR805/161	●	●	●	●	●	●	
VR805/391	●	●	●	●	●	●	
VR850/02	●	●		●	●		●
VR850/07	●	●	●	●	●		●
VR850/16	●	●	●	●	●		●
VR850/39	●	●	●	●	●		●
VR850/58	●	●	●	●	●		●

GB	D	F	
Technical Data	**Technische Daten**	**Caractéristiques**	
Mains voltage	Netzspannung	Tension secteur	220 – 240 V
Mains frequency	Netzfrequenz	Fréquence	47 – 63 Hz
Power consumption:	Leistungsaufnahme:	Puissance absorbée:	16 W during operation
with Low Power Standby	Standby mit geringem Verbrauch	avec la fonction veille faible consommation	< 4 W
Ambient temperature	Raumtemperatur	Température ambiante	+10°C to +35°C
Relative humidity	Relative Luftfeuchtigkeit	Humidité relative	20 – 80 %
Weight	Gewicht	Poids	4.3 kg
Fast forward/rewind time	Vor-/Rückspulzeit	Temps (re-)bobinage	typ. 95s (E180 cass.)
Position of use	Betriebslage	Position d'emploi	horizontally, max. 15°
Video resolution	Video-Auflösung	Résolution vidéo	≥ 240 lines VHS
Audio	Audio	Audio SP:	80Hz – 10kHz (±8dB)
		Audio LP:	80Hz – 5kHz (±8dB)
		FM Audio:	20Hz – 20kHz (±3dB)

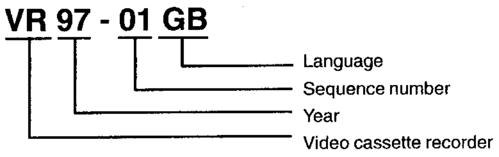
NL	E	I	
Technische Gegevens	**Datos Tecnicos**	**Dati Tecnici**	
Netspanning	Tensión de red	Tensione di alimentazione	220 – 240 V
Netfrequentie	Frecuencia de red	Frequenza di rete	47 – 63 Hz
Opgenomen vermogen:	Consumo de potencia:	Potenza assorbita:	16 W during operation
met Low Power Standby	con standby de bajo consumo	in attesa a basso consumo	< 4 W
Omgevingstemperatuur	Temperatura ambiente	Temperatura ambiente	+10°C to +35°C
Relatieve vochtigheid	Humedad relativa	Umidità relativa	20 – 80 %
Gewicht	Peso	Peso	4.3 kg
Vooruit/terugspoeltijd	tiempo de (re-)bobinado	Tempo di (ri-)avvolgimento	typ. 95s (E180 cass.)
Gebruikspositie	Posición de uso	Posizione di funzionamento	horizontally, max. 15°
Opplossend vermogen	Resolución video	Risoluzione video	≥ 240 lines VHS
Audio	Audio	Audio SP:	80Hz – 10kHz (±8dB)
		Audio LP:	80Hz – 5kHz (±8dB)
		FM Audio:	20Hz – 20kHz (±3dB)

Modifications

Description of the system used for publishing modification data and supplements to the service manual.

All modification data and supplements to the Service Manual are published by means of Service Information bulletins.

Each Service information has a number, for example :


VR 97 - 01 GB
Language
Sequence number
Year
Video cassette recorder

A Service Information bulletin concists of a front sheet, as the case may be followed by supplementary and/or replacement sheets.

Replacement sheets serve to replace existing sheets in the Service Manual. These sheets are identified by an additional letter after the page number, for example 5-1a. Page 5-1a then takes the place of page 5-1.

Supplementary sheets are inserted between the existing sheets in the Service Manual. These sheets can be identified by an additional figure following the page number, for example 5-1-1.

Sheet 5-1-1 should be inserted after page 5-1.

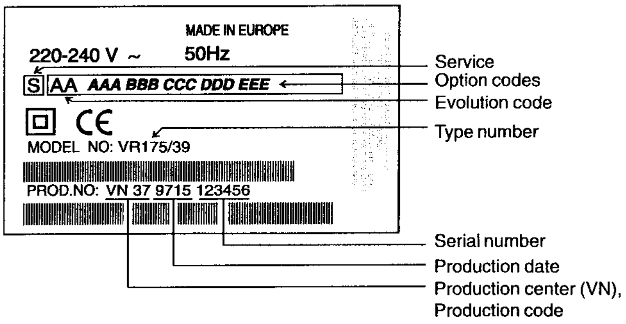
Description of the system by means of which modifications are indicated in the recorder.

All important parts of the recorder, such as tape deck, p.c. boards and modules, are provided with a sticker. These stickers specify a number of product data. The meaning of this data will now be explained for the most important sections.

The complete recorder

The type plate is located at the back of the recorder, below an example of such a type plate is given.

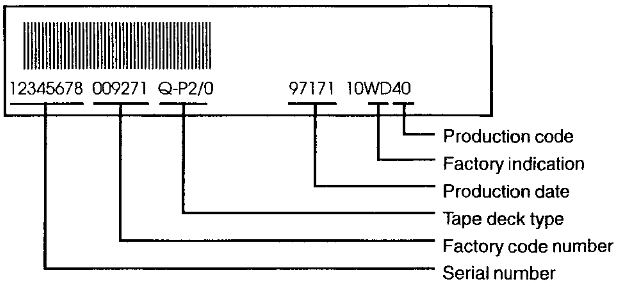
Type plate :


MADE IN EUROPE
220-240 V ~
50Hz
S
AA
AAA BBB CCC DDD EEE
CE
MODEL NO: VR175/39
PROD.NO: VN 37 9715 123456
Service
Option codes
Evolution code
Type number
Serial number
Production date
Production center (VN),
Production code

Note :

- In the case of an important modification to the recorder the production code on the type plate is increased by one. E.g. 37 becomes 38.
- In the case of an important modification to the service documentation the evolution code on the type plate is increased by one. E.g. AA becomes AB.

Tape deck


12345678 009271 Q-P2/0 97171 10WD40
Production code
Factory indication
Production date
Tape deck type
Factory code number
Serial number

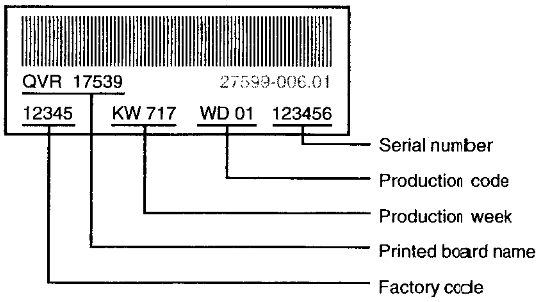
Note :

The production code and the serial number on the tape deck need not correspond to the production code and the serial number on the type plate.

Printed panels

The stickers are generally located on the track side of the module.

Example :


QVR 17539
27599-006.01
12345
KW 717
WD 01
123456
Serial number
Production code
Production week
Printed board name
Factory code

Remarks :

The production code number will not always be mentioned.

In case of an important modification, the last figure of the factory code number (point number) is increased by one. E.g. 6635.1 becomes 6635.2.

Safety instructions

- Safety regulations demand that the set be restored to its original condition and that components identical with the original types be used.

  Safety components are marked by the symbol ⚠

- All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair may reduce life drastically. When repairing, make sure that you are conneted with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools on the same potential.
- A set to be repaired should always be connected to the mains via a suitable isolating transformer.
- Never replace any modules or any other parts while the set is switched on.
- Use plastic instead of metal alignment tools. This in order to prelude short-circuit or to prevent a specific circuit from being rendered unstable.

Remarks

- The direct voltages and oscillograms ought to be measured relative to the set mass.
  EXCEPTION
  At the power supply, the DC voltages and the oscillograms at the primary side are measured to LIVE GND.
- The direct voltages and oscillograms mentioned in the diagrams ought to be measured with a colour bar signal and the picture carrier at 503.25 MHz (C25).
- The oscillograms and direct voltages have been measured in RECORD or PLAY mode.
- The semiconductors, which are mentioned in the circuit diagram and in the parts lists, are fully exchangeable per position with the semiconductors in the set, irrespective of the type designation of these semiconductors.

Sicherheitshinweise

- Die Sicherheitsvorschriften erfordern es, daß sich das Gerät nach der Reparatur in seinem originalen Zustand befindet und daß die zur Reparatur benutzten Ersatzteile mit den Originalersatzteilen identisch sind.

  Sicherheits-Bauteile sind mit der Markierung ⚠ versehen

- Alle IC's und Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD). Unvorschriftmässige Behandlung von Halbleitern im Reparaturfall kann zur Zerstörung dieser Bauteile oder zu einer drastischen Reduzierung der Lebensdauer führen. Sorgen Sie dafür, daß Sie sich im Reparaturfall über ein Armband mit Widerstand auf dem gleichen Potential, wie die Masse des Gerätes befinden. Alle Bauteile, Werkzeuge und Hilfsmittel sind auf das gleiche Potential zu legen.
- Ein zu reparierendes Gerät ist immer über einen Trenntransformator an die Netzspannung anzuschließen.
- Bei eingeschaltetem Gerät dürfen keine Module oder sonstige Einzelteile ausgetauscht werden.
- Zum Abgleich sind ausschließlich Kunststoffwerkzeuge zu benutzen (keine Metallwerkzeuge verwenden). Dadurch wird vermieden, daß ein Kurzschluß entstehen kann oder eine Schaltung instabil wird.

Anmerkungen

- Die Gleichspannung und Oszillogramme sind gegen Gerätemasse zu messen.
  AUSNAHME
  Beim Netzteil sind die Gleichspannungen und Oszillogramme auf der Primärseite gegen Live GND gemessen.
- Die Gleichspannungen und Oszillogramme angeführt in den Schaltbildern sollen unter folgenden Bedingungen gemessen werden: Farbbalkensignal, Bildträger auf 503.25 MHz (C25)
- Die Oszillogramme und Gleichspannungen sind in RECORD oder PLAY gemessen. Die in den Stücklisten aufgeführten Bauteile sind positionsweise voll auswechselbar gegen die Bauteile in dem Gerät, ungeachtet der etwaigen Typenbezeichungen.

Avertissements

- Les normes de sécurité exigent qu'aprés réparation l'appareil soit remis dans son état d'origine et que soient utilisées les piéces de rechange identiques à celles spécifiées.

  Les composants de sécurité sont marqués ⚠

- Tout les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharger statiques (ESD). Leur longévité pourrait étre considérablement écourté par le fait qu'aucune précaution n'est prise à leur manipulation. Lors de réparations s'assurer de bien étre relié au méme potential que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité. Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.
- Toujours alimenter un appareil à réparer à travers un transfo d'isolement.
- Ne jamais remplacer les modules ni d'autres composants quand l'appareil est sous tension.
- Pour l'ajustage, utiliser des outils en plastique au lieu d'instruments métalliques. Ceci afin d'éviter les court-circuits et exclure l'instabilité dans certains circuits.

Observations

- La mésure des tensions continues et des oscillogrammes doit se faire par rapport à la terre de l'appareil.
  EXCEPTION
  Sur l'unité d'alimentation la tension continue et l'oscillogramme sont mesurés sur le côte primaire en Live GND.
- La mésure des tensions continues et des oscillogrammes figurant sur le schéma doit se faire dans un signal de barre couleur porteuse image sur 503.25 MHz (C25).
- Les oscillogrammes et tension sont mésurées en mode RECORD ou PLAY.
- Les semi-conducteurs indiqués dans le schéma de principe et à la liste des compostants, sont interchangeables par repère sur ce chassis avec les semi-conducteurs de l'appareil quelle que soit la désignation de type donnée sur ces semi-conducteurs.

Veiligheidsinstructies

- Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, indentiek aan de oorspronkelijke, worden toegepast.

  De veiligheidsonderdelen zijn aangeduid met het symbool ⚠

- Alle IC's en vele andere halfgeleiders zijn gevoelig voor elektrostatische ontladingen (ESD). Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor, dat U tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat. Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.
- Sluit een apparaat dat gerepareerd wordt altijd via een scheidingstransformator aan op de netspanning.
- Verwissel nooit modules of andere onderdelen terwijl het apparaat is ingeschakeld.
- Gebruik voor het afregelen plastic i.p.v metalen gereedschap. Dit om mogelijke kortsluiting te voorkomen of een bepaalde schakeling instabiel te maken.

Opmerkingen

- De gelijksspanningen en oscillogrammen dienen gemeten te worden ten opzichte van de apparaat aarde.
- De gelijksspanningen en oscillogrammen vermeld in de schema's dienen gemeten te worden met een kleurbalkensignaal beelddraaggolf op 503.25 MHz (C25).
- De oscillogrammen en gelijksspanningen zijn in RECORD of PLAY mode gemeten.
- De halfgeleiders, die in het pricipeschema en in de stuklijsten, zijn vermeld, zijn per positie volledig uitwisselbaar met de halfgeleiders in het apparaat, ongeacht de typeaanduiding op deze halfgeleiders.

Avvertimenti

- Le prescrizioni di sicurezza richiedono che l'apparecchio sia ricondotto alle condizioni originali e che siano usati ricambi originali.

  Componenti di sicurezza sono marcati con ⚠

- Tutti gli IC e semiconduttori sono sensibili a scariche elettrostatiche (ESD). Noncuranze durante la riparazione di semiconduttori possono danneggiarli o condurre ad una riduzione drastica della durata. Durante la riparazione assicurarsi di essere collegati allo stesso potenziale attraverso un bracciale di protezione contro scariche elettrostatiche. Inoltre tenere anche tutti i componenti e gli attrezzi a questo potenziale.
- Apparecchi da riparare bisogna collegarli sempre via un trasformatore isolante (separatore) alla tensione normale.
- Non scambiare moduli o altri componenti quando l'apparecchio è in funzione.
- Per l'accordo usare soltanto attrezzi di plastica (non usare attrezzi metallici). Cosí si evitano cortocircuiti e collegamenti instabili.

Osservazioni

- Misurare le tensioni continue e gli oscillogrammi riferiendosi alla massa dell'apparecchio.
  ECCEZIONE
  Le tensioni continue e gli oscillogrammi dall'alimentatore sono misurati sulla parte primaria contro GND-Live.
- Le tensioni continue e gli oscillogrammi indicati negli schemi di collegamento devono essere misurati secondo le condizioni seguenti: segnale barre colore, portante dell'immagine su: 503.25 MHz (C25).
- Gli oscillogrammi e le tensioni continue sono misurati in RECORD o PLAYBACK.
- I componenti indicati nelle liste sono intercambiabili con quelli nell'apparecchio nonostante l'eventuale denominazione di modelli.

Avisos

- Las instrucciones de seguridad exigen que después de la reparación el aparato se encuentre en el estado original y que las piezas de repuesto, utilizadas para la reparación, sean idénticas a las originales.

  Los componentes de seguridad estan marcados con ⚠

- Todos los IC y semiconductores son sensibles a descargas electrostáticas (ESD). Un tratamiento no conforme a las instrucciones de semiconductores en caso de reparación, podría llevar a la destrucción de estos componentes, o a una reducción drástica de la duración. Tenga cuidado de que, en caso de reparación, estar al mismo potencial que la masa del aparato, por una pulsera con resistencia. Ponga todos los componentes, herramientas y recursos al mismo potencial.
- Para reparar un aparato hay que conectarlo siempre a la alimentación a traves de un transformador de aislamiento.
- Cuando un aparato está en marcha no pueden ser cambiados módulos u otras piezas de repuesto.
- Para los ajustes hay que utilizar exclusivamente herramientas de plástico (nunca herramientas metálicas). Así se evitaran cortocircuitos y circuitos inestables.

Notas

- Hay que medir las tensiones continuas y los oscilogramas contra la masa del aparato.
  UITZONDERING:
  Bij het netgedeelte zijn de gelijkspanningen en oscillogrammen aan de primaire kant tegen Live GND gemeten.
- Las tensiones continuas y los oscilogramas mencionados en los esquemas tienen que ser medidos de manera siguiente: señal barra de color portadora de imagen en 503.25MHz (C25)
- Los oscilogramas y las tensiones continuas son medidas en „RECORD“ y „PLAYBACK“
- Los componentes mencionados en las listas se los puede cambiar por los componentes en el aparato, a pesar de eventuales designaciones de tipos.

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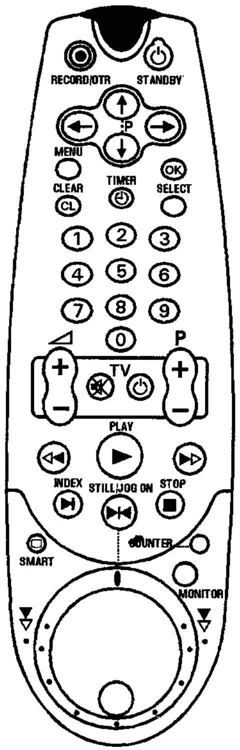
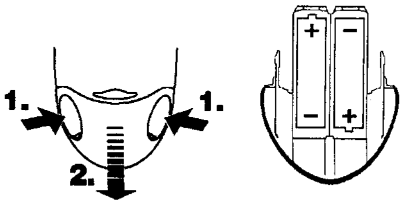
OPERATING INSTRUCTIONS IN BRIEF

The remote control



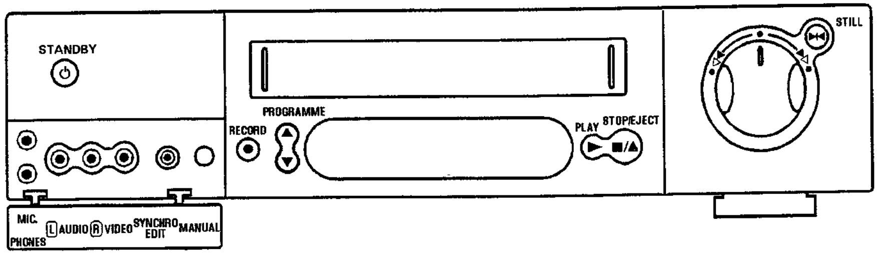


●RECORD/OTR	**Record/OTR:** Direct recording of the programme selected at this moment
⏻STANDBY	**Switch off** : Switch off set, interrupt menu function, interrupt TIMER-recording
P↑	**Programme/Menu button:** Programme number plus/Cursor up
P↓	**Programme/Menu button:** Programme number minus/Cursor down
←	**Menu button:** Cursor left
→	**Menu button:** Cursor right
MENU	**Menu button:** Call up main menu/End
OK	**Store/Confirm:** Store/Confirm entry
CLEAR (CL)	**Delete:** Delete last entry/Clear TIMER
TIMER ⏻	**TIMER:** Manual TIMER programming or alter/clear a programmed TIMER
SELECT	**Select:** Function selector
0-9	**Digit buttons:** 0 - 9
◁◀	**Rewind** : During STOP and STANDBY: rewind, during PLAYBACK: reverse scanning
PLAY ▶	**Playback** : Playback a recorded cassette
▶▷	**Forward wind:** During STOP and STANDBY: forward wind, during PLAYBACK: forward scanning
INDEX ▶|	**Index search:** In combination with ◁◀ / ▶▷ , search for previous/next recording-index on the tape
STILL/JOG ON ▶◀	**Still picture/JOG on:** Stop the tape and display the actual position on the tape as a still picture/switch on the 'JOG' function
STOP ■	**Pause/Stop:** Stop the tape, except during TIMER-recording
SMART ▢	**SMART:** Adjust the picture setting during playback
COUNTER	**Counter:** Select display of tape positon
MONITOR	**TV monitor** : Switch between TV reception and VCR playback
-⊙+	**SHUTTLE** : During STILL, select picture search speed with the outer dial (shuttle)
⊙	**JOG** : During STILL picture, select single picture with the inner dial (jog)

Additional TV-function

◿ +/−	**TV volume:** TV volume up/down
TV ⏻	**Switch off** : Switch off TV
TV 🔇	**TV sound off** : Switch off/on sound completely
P +/−	**TV Programme:** TV programme number up/down

Front of the set

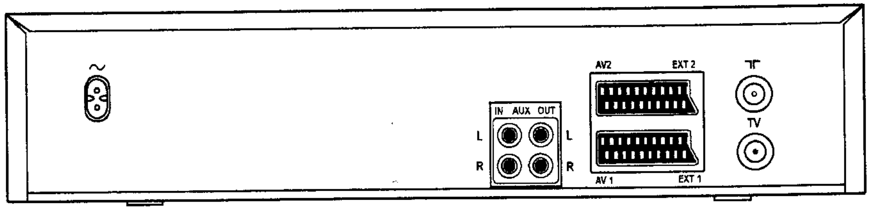


STANDBY ⏻	**Standby** : Switch off, interrupt function, interrupt TIMER recording
RECORD ●	**Record**: Record the programme selected at this moment
PROGRAMME ↑	**Programme number Plus**: Programme number up
PROGRAMME ↓	**Programme number Minus**: Programme number down
PLAY ▶	**Playback** : Playback a recorded cassette
STOP/EJECT ■/▲	**Pause/Stop**: Stop the tape, except during TIMER-recording
STILL ▶◀	**Still picture**: Stop the tape and display the actual position on the tape as a still picture
-⊙+	**Rotary control**: turn left: during STOP and STANDBY: rewind, during PLAYBACK: reverse scanning turn right: during STOP and STANDBY: wind, during PLAYBACK: forward scanning

Behind the flap at the lefthand corner on the front:

MIC.	**Microphone input socket**: To connect a microphone for dubbing (programme number 'MIC')
PHONES	**Headphones socket**: To connect headphones
L-AUDIO-R	**Audio input socket left/right** : To connect a camera recorder or video recorder (programme number 'E3')
VIDEO	**Video input socket** : To connect a camera recorder or video recorder ('E3')
SYNCHRO EDIT	**EDIT input socket** : To connect a suitable camera recorder
MANUAL	**Manual sound control** : To switch between automatic sound control and manual sound control

Back of the set



~	**Mains socket**: To connect the mains cable
AUX IN L R	**Audio input socket, left/right** : To connect a HiFi-set (programme number 'AUX')
AUX OUT L R	**Audio output socket, left/right** : To connect a HiFi-set.
AV2 EXT2	**Scart socket 2**: To connect a satellite receiver, decoder, video recorder, etc. (programme number 'E2').
AV1 EXT1	**Scart socket 1**: To connect the TV set (programme number 'E1').
˥˥	**Aerial input socket**: To connect the aerial cable
TV	**Aerial output socket**: To connect the TV set

1. INSTALLATION

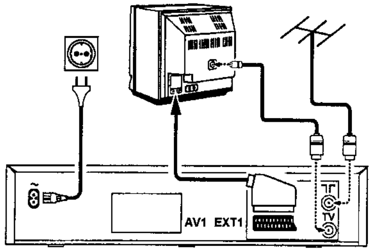
Connecting to the TV-set

When you install your Video recorder for the first time, please read:

- ☐ the paragraph 'Connecting with scart cable and Easy Link/NexTView', when your TV-set is equipped with 'Easy Link/NexTView'.
- ☐ the paragraph 'Connecting with scart cable without Easy Link/NexTView', when your TV-set is not equipped with 'Easy Link/NexTView'.
- ☐ the paragraph 'Connecting without a scart cable', when you do not use a scart cable.

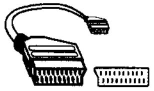
Connecting with scart cable and 'Easy link/NexTView'

With the function 'Easy Link/NexTView', your video recorder can exchange information with the television. Heed the operating instruction of your television.
With 'Easy Link/NexTView' the TV channels from the TV will automatically be loaded.

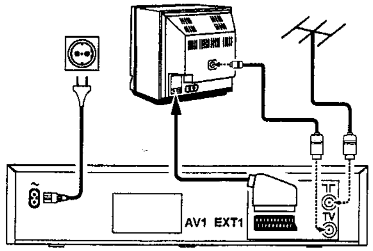


1. Remove the aerial cable plug from your TV set and insert it into the ⏉⏉ socket at the back of the video recorder.
2. Plug one end of the aerial cable provided into the TV socket on the video recorder and the other end into the aerial input socket on your TV set.
3. Plug one end of the special scart cable provided into the AV1 EXT1 scart socket at the back of the video recorder and the other end into the scart socket on your TV set.
4. Switch on the TV set.
5. Insert one end of the mains cable into the mains socket ~ at the back of the video recorder and the other end into the wall socket.
6. The video recorder will automatically load all TV channels stored on your TV, in the same sequence.
   This may take several minutes.
   When all data (TV channels, language, country) has been copied, the following text appears on the TV screen: 'EASY LINK LOADING COMPLETE'.
7. Check if clock and date are correct. Read the paragraph 'Setting Time/Date' in this chapter.

Connecting with scart cable without 'Easy Link/NexTView'

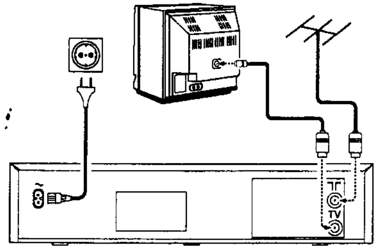


If your television **does not have a scart (EURO-AV) socket**, please **do not read further here**, but turn to the next paragraph 'Connecting without scart cable'.

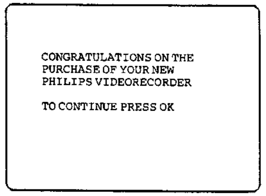


1. Remove the aerial cable plug from your TV set and insert it into the ⏉⏉ socket at the back of the video recorder.
2. Plug one end of the aerial cable provided into the TV socket on the video recorder and the other end into the aerial input socket on your TV set.
3. Plug one end of the scart cable into the scart socket AV1 EXT1 on the back of the video recorder and the other end into the scart socket on your TV set.
4. Switch on the TV set.
5. Insert one end of the mains cable into the mains socket ~ at the back of the video recorder and plug the other end into the wall socket.
6. When your TV set **automatically switches** to programme number e.g.: 'EXT', '0', or 'AV', a welcoming text appears on the TV screen.
   When your TV set does not switch automatically, select the required programme number manually (see instruction manual TV set).
7. Subsequently, read the paragraph 'Initial Installation' in the section 'Automatic TV Channel Search'.

Connecting without scart cable



1. Remove the aerial cable plug from your TV set and insert it into the ⏉⏉ socket at the back of the video recorder.
2. Plug one end of the aerial cable provided into the TV socket on the video recorder and the other end into the aerial input socket on your TV set.
3. Insert one end of the mains cable into the mains socket ~ at the back of the video recorder and plug the other end into the wall socket.
4. Switch on your TV set and select the programme number that you have chosen for video playback (see operating manual for your TV set).
5. The video recorder will now send a welcoming text on UHF-channel CH36or 591MHz.
6. Tune in the TV set in the UHF wave band until this picture appears.



CONGRATULATIONS ON THE
PURCHASE OF YOUR NEW
PHILIPS VIDEORECORDER

TO CONTINUE PRESS OK

7. Subsequently, read the paragraph 'Initial Installation' in the section 'Automatic TV Channel Search'.

Automatic TV Channel Search

Initial installation

1. Press the OK button.
2. Select your language with the menu buttons P↓ or P↑ and confirm with the OK button.
3. Select your country with the menu buttons P↓ or P↑. If your country is not displayed, select 'OTHERS'. Confirm with the OK button.
4. If the aerial has been connected to the video recorder, press the OK button.
   'Automatic TV Channel Search' starts.
5. When all TV channels have been found, 'AUTOMATIC SEARCH COMPLETE' appears on the TV screen.

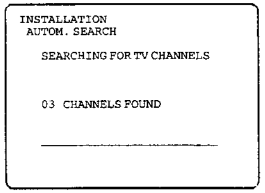
☐ 'TIME', 'YEAR', 'MONTH', 'DATE' appear on the TV screen.

6. If required, adjust 'TIME', 'YEAR', 'MONTH', 'DATE' with the digit buttons 0-9. To select between the fields, use the menu butons P↓ or P↑. Confirm each entry with the OK button.
7. To end, press the MENU button.

How to search for a TV channel manually, you can read in 'Manual TV Channel Search'.

Successive Installation

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the [MENU] button. The main menu appears.
3. Select the line 'INSTALLATION' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.
4. Select the line 'AUTOM. SEARCH' with the [P↓] or [P↑] menu button.
5. Press the [→] button. The 'Automatic TV Channel Search' starts.



```
INSTALLATION
 AUTOM. SEARCH

   SEARCHING FOR TV CHANNELS


   03  CHANNELS FOUND

   ______________________________
```

6. When the TV channel search is complete, 'AUTOMATIC SEARCH COMPLETE' will appear on the screen.
7. To end, press the [MENU] button.

How to search for a TV channel manually, you can read in the section 'Manual Channel Search'.

Automatic TV Channel Allocation (FOLLOW TV)

With this function the video recorder maintains the same channel sequence as on the TV set, in case you connected your videorecorder to a TV set **without scart cable**. This only functions if the video recorder (socket [AV1 EXT1]) and the TV set are **connected with a scart cable**. Additional equipment connected to socket [AV2 EXT2] must be **switched off**.

▷ With 'Connecting with scart cable and 'Easy Link/NexT-View', this function will start the data transfer.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the [MENU] button. The main menu appears.
3. Select the line 'INSTALLATION' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.
4. Select the line 'FOLLOW TV' with the menu buttons [P↓] or [P↑] and confirm with the [→] button. Take notice of the message on the TV screen.
5. Press the [OK] button.
   If the video recorder recognizes that the TV set has been connected with a scart cable, 'TV' 01' appears in the display.

☐ When 'NOTV' (no signal from TV set) appears in the display, the TV channels can not be allocated automatically. In this case, read paragraph: 'Manual TV Channel Number Allocation'.

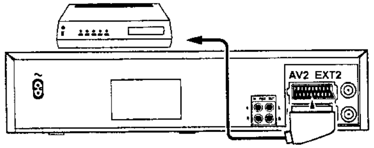
6. Select programme number '1' **on the TV set**.
7. Confirm with the [OK] button on the video recorder-remote control. The video recorder compares the TV channels on the TV set and the video recorder.
   If the video recorder found the same TV channel as the TV set, then it stores it at 'P01'.
8. Wait until e.g.: 'TV' 02' appears.
9. Select the next programme number, e.g.: '2' **on the TV set**.
10. Confirm with the [OK] button on the video recorder-remote control.

▷ If you allocated the wrong TV channel, you can go back one step with the menu button [←].

11. Repeat steps [8] to [10] until all TV channels have been allocated.
12. To finish, press the [MENU] button.

Connecting a decoder or additional equipment

You can also connect additional equipment to the [AV2 EXT2] socket. For instance: decoder, satellite receiver or camera recorder.
You can connect a HIFI-stereo set to the sockets [AUX OUT L R] (audio output left/right) and [AUX IN L R] (audio input left/right).



Allocating a decoder

With this function, the connected decoder will automatically be activated for the TV programme required.

▷ With 'Connecting with scart cable and 'Easy Link/NexT-View' the decoder must be activated for the TV set.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. On the video recorder, select the TV programme you wish to link with the decoder function, using the [P↑] or [P↓] button or the digit buttons [0-9].
3. Press the [MENU] button. The main menu appears.
4. Select the line 'INSTALLATION' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.
5. Select the line 'MANUAL SEARCH' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.
6. Select the line 'DECODER' with the menu buttons [P↓] or [P↑].
7. Select function 'ON' with the menu buttons [←] or [→].
   When you select 'OFF', the function will be switched off.
8. Confirm with the [OK] button.

▷ When the function is switched on, 'DEC' appears in the display.

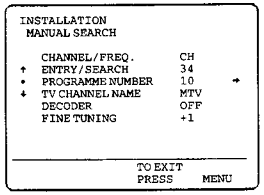
9. To end, press the [MENU] button.

Manual TV Channel Search

In certain cases the 'Automatic TV Channel Search' may not be able to find all of the TV channels (e.g. coded TV channels). In that case, use this manual method to set the channels.

▷ With 'Connecting with scart cable and 'Easy Link/NexT-View' the videorecorder automatically loads the TV channels from the TV set. Hence, some lines are not functional.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the [MENU] button. The main menu appears.
3. Select the line 'INSTALLATION' with the menu buttons [P↓] or [P↑] and confirm with the menu button [→].
4. Select the line 'MANUAL SEARCH' with the menu buttons [P↓] or [P↑] and confirm with the menu button [→].



```
INSTALLATION
 MANUAL SEARCH

   CHANNEL/FREQ.          CH
↑  ENTRY/SEARCH           34
•  PROGRAMME NUMBER       10       →
↓  TV CHANNEL NAME        MTV
   DECODER                OFF
   FINE TUNING            +1

─────────────────────────────────────
                   TO EXIT
                   PRESS     MENU
```

5. In the line 'CHANNEL/FREQ.', select the display for:
   'FREQ.': frequency
   'CH': channel
   'S-CH': special channel
6. If you know the frequency or channel of the desired TV channel, you can enter the data in line 'ENTRY/SEARCH' with the digit buttons [0-9].

☐ If you don't know the frequency or channel of the TV channel of your choice, press the menu button [→] to start the channel search.

7. In the line 'PROGRAMME NUMBER' select the programme number you want e.g.: '01', using the menu buttons [←] or [→].
8. If you want to change the TV channel name, press the [→] button in line 'TV CHANNEL NAME'.

☐ Select the character you want to change with the [←] or the [→] button. Change the character with the [P↓] or the [P↑] button. Select the next character in the same way.

☐ Keep pressing the menu button [→] until the cursor disappears.

9. If you want to change the automatic tv channel setting, select the line 'FINE TUNING'.
   With the menu buttons [←] or [→] you can vary the automatic tv channel setting. **Important:** This re-tuning is only necessary and useful in **special cases**, e.g.: when there are stripes on the picture with cable-TV systems.
10. Press the [OK] button to store the TV channel.
11. If you want to search for further TV channels, start again at step [6].
12. To end, press the [MENU] button.

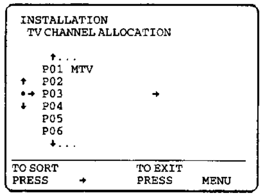
Monitor function

You can switch back and forth between TV reception and video recorder reception with the [MONITOR] button. This only functions when you used a scart cable to connect the video recorder to your TV set and if your TV set responds to this switch-over.

Sort/Clear TV Channels manually

ⓘ With 'Connecting with Easy Link/NexTView' the video recorder automatically loads the TV channels from the TV set. Hence, you can not select this function.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the [MENU] button. The main menu appears.
3. Select the line 'INSTALLATION' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.
4. Select the line 'TV CHANNEL ALLOCATION' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.



```
INSTALLATION
 TV CHANNEL ALLOCATION

     ↑...
    P01  MTV
↑   P02
•→  P03             →
↓   P04
    P05
    P06
     ↓...
-------------------------------------
TO SORT             TO EXIT
PRESS     →         PRESS      MENU
```

5. With the menu buttons [P↓] or [P↑], select the TV channel to which you want to allocate a programme number (starting with 'P01' and press the [→] button.

ⓘ If you want to delete a TV channel, press the [CLEAR (CL)] button.

6. With the menu buttons [P↓] or [P↑], shift the TV channel to the programme number you wish to allocate to this TV channel and press the [←] button. The TV channel will *be added.*
7. *Repeat steps* [5] *to* [6] *until you have allocated a* programme number to all TV channels.
8. To store, press the [OK] button.
9. To end, press the [MENU] button.

Setting the language

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the [MENU] button. The main menu appears.
3. Select the line 'INSTALLATION' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.
4. Select the line 'LANGUAGE' and confirm with the [→] button.
5. Select your language with the [P↓] or [P↑] menu button and confirm with the [OK] button.
6. To end, press the [MENU] button.

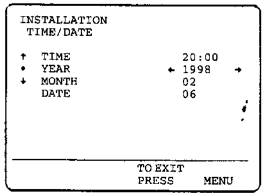
Setting the country

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the [MENU] button. The main menu appears.
3. Select the line 'INSTALLATION' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.
4. Select the line 'COUNTRY' and confirm with the [→] button.
5. Select your country with the menu buttons [P↓] or [P↑]. If your country doesn't show up, select 'OTHERS'.
6. Confirm with the [OK] button.
7. To end, press the [MENU] button.

Setting the clock and the date

If the time in the video recorder display is not correct or if '--:--' appears in the display, please set the clock manually.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the [MENU] button. The main menu appears.
3. Select the line 'INSTALLATION' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.
4. Select the line 'TIME/DATE' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.



```
INSTALLATION
 TIME/DATE

↑   TIME                20:00
•   YEAR              ← 1998     →
↓   MONTH               02
    DATE                06

-------------------------------------
                TO EXIT
                PRESS       MENU
```

5. Adjust 'TIME', 'YEAR', 'MONTH', 'DATE' if required, using the digit buttons [0-9]. Switch between fields with the menu buttons [P↓] or [P↑].
6. Confirm each entry with the [OK] button.
7. To end, press the [MENU] button.

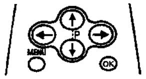
ⓘ If a TV channel which transmits TXT/PDC is stored with programme number 'P01', time (from TXT) and date (from PDC) will automatically be taken from the TXT/PDC information.

User guide (OSD)

With OSD (On Screen Display) the corresponding functions appear on the TV screen as a menu. The most important button-functions are displayed at the bottom of the screen.

- ☐ **Call up the menu:** With the [MENU] button.
- ☐ **Select a line:** With the [P↓] or [P↑] button.
- ☐ **Select within a line:** With the menu buttons [←] or [→].

- ☐ **Enter/Alter:** With the ← or → or with the 0-9 button.
- ☐ **Store:** With the OK button.
- ☐ **Confirm:** With the menu button →.
- ☐ **Exit menu:** With the MENU button.



Emergency interrupt

Both the video recorder and the remote control have an 'Emergency interrupt' button. You can use the ⏻STANDBY button to interrupt any function.
Whenever you have operating problems you can simply interrupt the function and start again.
You can practise operating your set without any worries. No matter which buttons you press, you cannot damage it.

Important notes for operation

- ☐ You can switch on with the STOP■ button, the 0-9 buttons or by inserting a cassette.
- ☐ Keep your video recorder connected to the mains at all times to ensure that programmed recordings can be made and that the television functions normally. The power consumption required is less than 4W (saving energy mode).
- ☐ When the video recorder is disconnected from the mains, TV channels will be strored typically 1 year, and clock/timer data will be stored typically 7 hours.

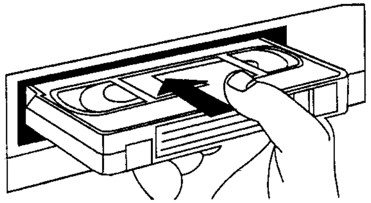
Saving energy

You can choose between two methods of switching to standby.
Normal method: Switch to standby using the ⏻STANDBY button. The clock time remains displayed.
If the clock has not been set, '--:--' appears.
To save energy: Press the ⏻STANDBY button twice. The clock time disappears from the display.

2. PLAYBACK

Playback a cassette

1 Insert a cassette into the cassette slot.



2 Press the PLAY► playback button.

3 To stop, press the STOP■ button.

4 To eject, Press the STOP/EJECT■/▲ button on the set.

▷ Some hired cassettes may have a poor picture/sound quality. This is not a fault in your set. Please read the section 'Selecting the picture setting (SMART PICTURE)', or 'Eliminating picture interference'.

▷ Some functions switch off automatically after a while (e.g.: Pause, Still Picture, Scanning). This helps to protect the cassette and prevent unnecessary power consumption.

NTSC Playback

With this set you can playback cassettes that have been recorded on another video recorder in the NTSC standard. This only works for PAL-television sets which are suitable for a picture frequency of 60 Hz.
During NTSC playback '60HZ' appears in the display.

▷ During NTSC-playback some special features (e.g. still picture) are not possible.

Tape position indication

1 During playback press the COUNTER button.

2 Select one of the following obtions:
'TIME USED' to indicate the time used on the tape
'TIME LEFT' to indicate the time left on the tape
'COUNTER' to indicate the actual position on the tape

▷ With the OK button, you can superimpose the actual tape position on the TV screen.

Searching for tape position with picture (picture search)

1 During playback, press the ◁◀ (reverse) or ▶▷ (forward) button once or several times.

2 To interrupt at the position required, press the PLAY► button.

▷ During picture search, the picture quality is affected and the sound is turned off.

The JOG/SHUTTLE functions

You will find a large rotary knob (Shuttle) -⊙+ both on the video recorder and the remote control.

1 Switch the function on with the STILL▶|◀ button.
You will see a still picture.

2 Use the inner JOG disc on the remote control to select the next or previous still picture.

3 Turning the inner disc continuously to the right or to the left switches to slow motion, forward or reverse.

4 The outer SHUTTLE ring enables you to select different tape speeds for the forward or reverse picture search.

Searching for tape position without picture (wind/rewind)

1 Stop the tape with the STOP■ button.

2 Press the ◁◀ (reverse) or ▶▷ (forward) button. If you want to carry out this function on your video recorder, turn the outer rotary control (Shuttle) -⊙+ to the left or to the right.

3 To interrupt at the position required, press the STOP■ button.

Quick View

With this function you can switch to picture search during wind/rewind.

1. If you hold the ◀◀ (rewind) or ▶▶ (wind) button during wind or rewind, you will switch to picture search.

2. If you release the button, the video recorder will automatically switch back to rewind or wind.

Automatic search for tape position (Index search)

At the beginning of each recording, the video recorder marks the tape with a index code mark.

1. Press the INDEX▶| button. Then press the ▶▶ button to select the next code mark or the ◀◀ button for the previous code mark.

2. When the video recorder finds the code mark or a blank space it will automatically switch to playback.

▷ You can only search for a blank space with recordings made on a video recorder that does not have this index code mark function.

Selecting the picture setting (SMART PICTURE)

During playback, you can change the picture setting:

1. During playback, press the SMART▢ button. The current selection will be shown.

2. Press the SMART▢ button repeatedly to select the required picture setting.

3. Confirm the new setting with the OK button.

This picture setting will remain until you eject the cassette.

Eliminating picture interference

When the picture quality is poor, please proceed as follows:

Tracking during playback

1. During playback, press the MENU button.

2. Select the line 'PLAY FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the → button.

3. Select the line 'MANUAL TRACKING' with the menu buttons P↓ or P↑.

4. Hold the menu buttons ← or → until the playback quality is at its best.

5. Confirm with the OK button.

6. To end, press the MENU button. This setting will remain until you remove the cassette.

Tracking during still picture

If the still picture vibrates vertically, you can improve the still picture as follows:

1. During still picture, press the MENU button.

2. Select the line 'PLAY FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the → button.

3. Select the line 'VERTICAL STABILITY' with the menu buttons P↓ or P↑.

4. Hold the menu buttons ← or → until the picture quality is at its best.

5. Confirm with the OK button.

6. To end, press the MENU button.

Cleaning the video heads

1. During playback, press the MENU button.

2. Select the line 'PLAY FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the → button.

3. Select the line 'HEAD CLEANING' with the menu buttons P↓ or P↑.

4. Press the OK button. 'HEAD CLEANING IN PROGRESS' appears on the screen.

5. Wait a few seconds, until the message disappears and then press the MENU button.

3. MANUAL RECORDING

Recording without automatic switch-off.

1. Insert a cassette.
2. Use the P↑ or P↓ button to select the programme number (programme name) from which you wish to record.

▷ When the function 'Direct record' is switched on, select the programme number on the TV set. With the video recorder **switched on**, press the ●RECORD/OTR button.

▷ When a TV channel transmits a channel name, it will show in the display.

▷ Programme numbers 'E1' and 'E2' are provided for recording from external sources (via scart sockets AV1 EXT1 and AV2 EXT2). Programme number 'E3' is provided for recording from the front sockets VIDEO and L-AUDIO-R.

▷ Programme numbers 'AUX' and 'MIC' are provided for audio recordings (via sockets AUX IN L R) and the microphone socket 'MIC'.

3. Press the ●RECORD/OTR button.
4. Stop recording with the STOP■ button.

Recording with automatic switch-off (OTR One-Touch-Recording)

1. Insert a cassette.
2. Use the P↑ or P↓ button to select the programme number (programme name) from which you wish to record.
3. Press the ●RECORD/OTR button.
4. Press the ●RECORD/OTR button repeatedly to obtain the required end time or length of the recording.

▷ To cancel this entry, press the CLEAR (CL) button.

Erase protection

So that you don't accidentally delete an important recording, remove the special tab (erase protection) on the narrow side of the cassette with a screwdriver or slide the special tab to the left. Later, if you no longer want the cassette to be erase protected, you can seal the gap again with adhesive tape or slide the special tab to the right.

Auto-assembling

You can use the auto-assembling function to join individual recordings without any major picture disturbance between the recordings.

1. During playback, search for the correct position on the tape.
2. Stop playback by pressing the STOP■ button. 'PAUSE' appears on the TV screen.
3. Now start recording as usual by pressing the ●RECORD/OTR button.

Selecting the recording speed (SP/LP)

You can reduce the recording speed by half. This makes it possible to record, for example, 8 hours instead of 4 hours on an 'E240' (4 hour) cassette.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the MENU button. The main menu appears.
3. Select the line 'RECORD FUNCTIONS' with the menu buttons P↓ or P↑, and confirm with the → button.
4. Select the line 'RECORD SETTINGS' with the menu buttons P↓ or P↑, and confirm with the → button.
5. Select the line 'RECORD SPEED' with the menu buttons P↓ or P↑.
6. Select the required recording speed with the menu buttons ← or →.

▷ **'LP'**: Long Play = half recording speed (double recording time).
'SP': Standard Play = normal recording speed.

▷ The picture quality will be adversely affected when recording at half recording speed ('LP').

▷ For playback, the correct recording speed will automatically be selected.

7. Confirm with the OK button.
8. To end, press the MENU button.

Automatic recording from a satellite receiver (SAT RECORDING)

You can only use this function, when you have a satellite receiver, which can control other equipment by a 'programming' function.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the MENU button. The main menu appears.
3. Select the line 'RECORD FUNCTIONS' with the menu buttons P↓ or P↑, and confirm with the → button.
4. Select the line 'RECORD SETTINGS' with the menu buttons P↓ or P↑, and confirm with the → button.
5. Select the line 'SAT RECORD' with the menu buttons P↓ or P↑.
6. Select the required scart socket 'E1' or 'E2' with the menu buttons ← or →.
If you want to switch off the function, select 'OFF' with the menu buttons → or ←.
7. Confirm with the OK button.
8. Use a scart cable to connect the scart socket you selected on the video recorder (AV1 EXT1 or AV2 EXT2) to the corresponding scart socket on the satellite receiver.
9. Insert a cassette.
10. To end, press the ⏻STANDBY button. The video recorder is now prepared for recording. The start and end of the recording is controlled via one of the scart sockets.

▷ When this function is switched on, '📡' appears in the display.

Direct Record

With this function switched on, and the video recorder **switched to standby**, the video recorder automatically takes the channel number which is currently selected on the television when it starts recording, by means of the scart cable.

▷ With 'Connecting with scart cable and 'Easy Link/NexT-View', the video recorder also takes the programme number from the TV set automatically with the video recorder switched on.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the MENU button. The main menu appears.
3. Select the line 'RECORD FUNCTIONS' with the menu buttons P↓ or P↑, and confirm with the → button.
4. Select the line 'RECORD SETTINGS' with the menu buttons P↓ or P↑, and confirm with the → button.
5. Select the line 'DIRECT RECORD' with the menu buttons P↓ or P↑.
6. Select the function 'ON' with the menu buttons ← or →. If you select 'OFF', the function will be switched off.
7. Confirm with the OK button.
8. To end, press the MENU button.
9. Switch off with the ⏻STANDBY button.
10. On the TV set, select the programme number you want make the recording from.
11. Press the ●RECORD/OTR button with the video recorder **switched off**.

▷ Don't select another programme number on your TV set, until the 'search symbol' in the display of your video recorder disappears. This can take up to one minute.

▷ When 'NOTV' appears in the display, the programme number could not be found. The video recorder switches off automatically.

4. AUTOMATIC (PROGRAMMED) RECORDING

The video recorder needs the following information for every programmed recording:

* the date on which the recording is to be made
* the programme number for the TV channel
* the start and stop time of the recording
* VPS/PDC on or off
* the recording speed (SP/LP)

The video recorder stores all the information mentioned above in a TIMER block. You can programme up to 6 TIMER blocks, one month in advance.

'VPS' (Video Programming System) / 'PDC' (Programme Delivery Control)

With 'VPS/PDC', the TV station controls the beginning and the length of the programmed recording. This means that the video recorder switches itself on and off at the **right time** even if a TV programme you have programmed begins earlier or finishes later than expected.
Usually the start time is the **same** as the VPS/PDC time. If, however, in the TV guide, in addition to a TV programme's start time, a different VPS/PDC time is given, e.g.: '20.15 (VPS 20.14)', you must enter '20.14' as the start time **exactly to the minute.**
If you want to enter a time that differs from the VPS/PDC time, you must switch off 'VPS/PDC'.

Programming with 'SHOWVIEW'

All the information required for a programming is contained encoded in the SHOWVIEW code.

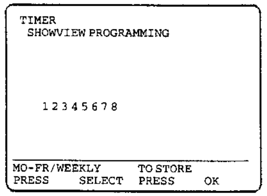
SHOWVIEW

1 Switch on the TV set. If required, select the programme number for the video recorder.

2 Press the [TIMER ⏲] button on the remote control. The programming mode selected last is marked.

3 Select the line 'SHOWVIEW' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.

4 Enter the entire SHOWVIEW-code (up to 9 digits) printed in your TV guide next to the start time of a TV programme. If you made a mistake, clear the entry with the [CLEAR (CL)] button.



```
TIMER
 SHOWVIEW PROGRAMMING


   12345678


MO-FR/WEEKLY        TO STORE
PRESS    SELECT    PRESS     OK
```

5 Select programming at daily or weekly intervals with the [SELECT] button.
'MO-FR': recording at daily intervals from Mondays to Fridays inclusive.
'WEEKLY': recording at weekly intervals on the same day of the week.

6 Confirm with the [OK] button. The TIMER data will now appear on the TV screen.

▷ If SHOWVIEW does not recognize the TV channel, 'PLEASE ENTER PROGRAMME NUMBER' appears on the TV screen. Select the required programme number (programme name) with the [P↑] or the [P↓] button. Confirm with the [OK] button.

▷ If 'SHOWVIEW CODE WRONG' appears on the TV screen, you entered an incorrect code number or the incorrect date. Repeat the entry or end with the [TIMER ⏲] button.

▷ If 'WEEKEND PROGRAMMING - NOT POSSIBLE' appears on the TV screen, the date was incorrectly entered. 'Daily' programming can only be used for recordings to be made from Mondays to Fridays inclusive.

▷ Use the [SELECT] button to switch 'VPS/PDC' on or off in 'START'.

▷ Use the [SELECT] button to select the recording speed 'SP' or 'LP' in 'END'.

7 Confirm with the [OK] button.

▷ The data has been stored in a TIMER block.

8 To end, press the [TIMER ⏲] button.

9 Please note that you inserted a cassette without erase protection. Switch off with the ⏻STANDBY button.
The programmed recording will only function when the video recorder is **switched off** with the ⏻STANDBY button.

▷ If one or more of the TIMER blocks are occupied, '⏲' lights up in the display.

▷ If the end of the cassette is reached during a recording, the cassette will automatically be ejected.

▷ If you forget to load a cassette, 'NO CASSETTE' appears on the TV screen and '⏲' lights up in the display.

▷ If you inserted a cassette with erase protection when you want to start a recording, the cassette will be ejected.

▷ Programme numbers 'E1' and 'E2' are provided for external recordings (via scart socket AV1 EXT1 or AV2 EXT2).

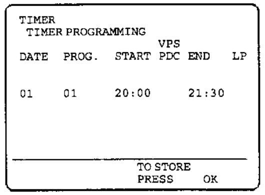
▷ Programme number 'AUX' and 'MIC' are provided for audio recordings (via sockets AUX IN L R) and the microphone socket 'MIC.'.

Manual recording without 'SHOWVIEW'

1 Switch on the TV set. If required, select the programme number for the video recorder.

2 Press the TIMER⏲ button on the remote control.
The programming mode selected last is marked.

3 Select the line 'TIMER PROGRAMMING' with the menu buttons P↓ or P↑ and confirm with the → button.



```
TIMER
 TIMER PROGRAMMING
                          VPS
DATE    PROG.    START   PDC   END     LP

01      01       20:00         21:30


                         TO STORE
                         PRESS      OK
```

4 Select the entry field with the menu buttons ← or →.

5 Enter data with the menu buttons P↓ or P↑ or with the digit buttons 0-9.

▷ Select recording at daily or weekly intervals in the field 'DATE', with the SELECT button.
'MO-FR': Recording to be made from Mondays to Fridays inclusive.
'MO': Weekly recordings on the same weekday.

▷ Use the SELECT button to switch 'VPS/PDC' on or off in 'START'.

▷ Use the SELECT button to select the recording speed 'SP' or 'LP' in 'END'.

6 Confirm with the OK button.

▷ The data has been stored in a TIMER block.

7 To end, press the TIMER⏲ button.

8 Please note that you inserted a cassette without erase protection. Switch off with the ⏻STANDBY button.
The programmed recording will only function when the video recorder is **switched off** with the ⏻STANDBY button.

▷ If one or more of the TIMER blocks are occupied, '⏲' lights up in the display.

▷ If the end of the cassette is reached during a recording, the video recorder automatically ejects the cassette. The set switches off after a few minutes.

▷ If you forget to load a cassette, 'NO CASSETTE' appears on the TV screen and '⏲' lights up in the display.

▷ If you inserted a cassette with erase protection, the cassette will be ejected.

▷ Programme numbers 'E1' and 'E2' are provided for external recordings (via scart socket AV1 EXT1 or AV2 EXT2).

▷ Programme number 'AUX' and 'MIC' are provided for audio recordings (via sockets AUX IN L R) and the microphone socket 'MIC.'.

How to check or alter a TIMER

1 Switch on the TV set. If required, select the programme number for the video recorder.

2 Press the TIMER⏲ button on the remote control.
The programming mode selected last is marked.

3 Select the line 'TIMER LIST' with the menu buttons P↓ or P↑ and confirm with the → button.

4 Select the TIMER you want to check or alter with the menu buttons P↓ or P↑.

5 Press the menu button →.

6 Select what you want to check or alter data with the menu buttons ← or →.

7 Alter data with the menu buttons P↓ or P↑ or with the digit buttons 0-9.

8 Confirm with the OK button.

9 To end, press the TIMER⏲ button.

10 Please note that you inserted a cassette without erase protection. Switch off with the ⏻STANDBY button.
The programmed recording will only function when the video recorder is **switched off** with the ⏻STANDBY button.

How to clear a TIMER

1 Switch on the TV set. If required, select the programme number for the video recorder.

2 Press the TIMER⏲ button on the remote control.
The programming mode selected last is marked.

3 Select the line 'TIMER LIST' with the menu buttons P↓ or P↑ and confirm with the → button.

4 Select the TIMER you want to clear with the menu buttons P↓ or P↑.

5 Press the CLEAR (CL) button.

6 Confirm with the OK button.

7 Switch off with the TIMER⏲ button.

'NexTView Link'

This video recorder is equipped with the function 'NexTView Link'. If your television is also equiped with this function, you can mark TV programmes on the television for programming. These TV programmes will automatically be transmitted to a TIMER block on the video recorder. If you clear the marking of the TV programme on the television, the corresponding TIMER block on the video recorder will also be cleared.
For more information, read the instruction manual of your TV set.

5. ADDITIONAL FUNCTIONS

Changing the TV system

If you play back recordings made on another video recorder, the automatic TV system switch-over may lead to colour interferences.

[1] Switch on the TV set. If required, select the programme number for the video recorder.

[2] Press the [MENU] button. The main menu appears.

[3] Select the line 'SPECIAL SETTINGS' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.

[4] In the line 'TV SYSTEM' select the required TV system with the menu buttons [←] or [→].

[5] Confirm with the [OK] button.

[6] To end, press the [MENU] button.

▷ If colour interference still occurs, you can switch to 'B/W' (black and white) in line 'TV SYSTEM'.

Child lock

[1] Switch on the TV set. If required, select the programme number for the video recorder.

[2] Press the [MENU] button. The main menu appears.

[3] Select the line 'SPECIAL SETTINGS' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.

[4] In the line 'CHILD LOCK' select 'ON' with the menu buttons [←] or [→].

[5] Confirm with the [OK] button.

[6] To end, press the [MENU] button.
'σ' appears in the video recorder display.
Keep the remote control in a safe place.

[7] If you want to switch off the child lock, select 'OFF' in line 'CHILD LOCK'. 'σ' disappears from the video recorder display.

▷ *If a button is pressed with activated child lock, 'σ'* flashes in the display for a few seconds.

▷ Programmed recordings are made despite the child lock and cannot be interrupted.

You may also activate the child lock with the remote control. Press the [⏻STANDBY] button on the remote control for a few seconds, until 'σ' appears in the video recorder display. Switch the child lock off in the same way.

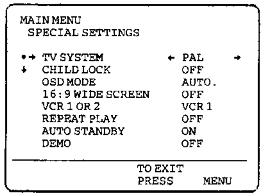
On Screen Display (OSD)

You can switch the On Screen Display (OSD) on or off.

[1] Switch on the TV set. If required, select the programme number for the video recorder.

[2] Press the [MENU] button. The main menu appears.

[3] Select the line 'SPECIAL SETTINGS' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.



```
MAIN MENU
 SPECIAL SETTINGS

•→ TV SYSTEM            ← PAL     →
↓  CHILD LOCK             OFF
   OSD MODE               AUTO.
   16:9 WIDE SCREEN       OFF
   VCR 1 OR 2             VCR 1
   REPEAT PLAY            OFF
   AUTO STANDBY           ON
   DEMO                   OFF
───────────────────────────────────
                  TO EXIT
                  PRESS     MENU
```

[4] Select the line 'OSD MODE' with the menu buttons [P↓] or [P↑].

[5] Select one of the options indicated with the menu buttons [→] or [←].
'AUTO.': OSD appears for a few seconds each time an operating mode is selected and then disappears.
'OFF': OSD is switched off.
'ON': OSD is switched on.

[6] Confirm with the [OK] button.

[7] To end, press the [MENU] button.

▷ With the [OK] button you can superimpose the current operating mode on the TV screen.

How to switch to 16:9

You can only use this function, when the video recorder (socket [AV1 EXT1]) and the TV set are connected with a scart cable.

[1] Switch on the TV set. If required, select the programme number for the video recorder.

[2] Press the [MENU] button. The main menu appears.

[3] Select the line 'SPECIAL SETTINGS' with the menu buttons [P↓] or [P↑] and confirm with the [→] button.

[4] If you have a TV set in wide-screen format, select 'ON' in line '16:9 WIDE SCREEN'. If not, select 'OFF' with the menu buttons [→] or [←].

[5] Confirm with the [OK] button.

[6] To end, press the [MENU] button.

Switching the remote control command

If you have two video recorders with the same remote control command, you can change the remote control command of the handset and the remote control command of one of the video recorders.

[1] Switch on the TV set. If required, select the programme number for the video recorder.

[2] Press the [MENU] button. The main menu appears.

[3] Select the line 'SPECIAL SETTINGS' with the menu buttons [P↓] or [P↑] and confirm with the menu button [→].

[4] Select the line 'VCR 1 OR 2' with the menu buttons [P↓] or [P↑].

[5] Select 'VCR 1' or 'VCR 2' with the menu buttons [←] or [→]

[6] Confirm with the [OK] button.

[7] On the remote control, press the [SELECT] button and the digit button [2] **at the same time** to switch the remote control to 'VCR 2'.

▷ If you want to switch back to 'VCR 1, press the [SELECT] button and the digit button [1] **at the same time**.

[8] Confirm with the [OK] button.

▷ If the menu does not disappear, the video recorder didn't recognize the remote control command. Repeat step [7].

▷ After you changed the batteries of the remote control, it will switch back to 'VCR 1'.

▷ If you entered the wrong remote control command, the message e.g.: 'VCR ONLY RESPONDS TO VCR 1 COMMANDS' appears on the TV screen or 'VCR 1' appears in the video recorder display, when you press a button for a few seconds.

Continuous playback

[1] Press the [MENU] button. The main menu appears.

[2] Select the line 'SPECIAL SETTINGS' with the menu buttons [P↓] or [P↑]. Confirm with the menu buton [→].

[3] Select the line 'REPEAT PLAY' with the menu buttons [P↓] or [P↑].

[4] Select 'ON' with the menu buttons [←] or [→]. If you select 'OFF', the function will be switched off.

[5] Confirm with the [OK] button.

[6] Press the [MENU] button.

[7] Insert a cassette and start the continuous playback with the [PLAY►] playback button.
When the end of the tape or the end of the recording has been reached, it rewinds and starts playback again.

The automatic switch-off

If the video recorder is not used for a few minutes in certain modes (e.g.: STOP), it switches to standby automatically. You can switch off this automatic switch-off in order to use the video recorder as a television receiver.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Press the MENU button. The main menu appears.
3. Select the line 'SPECIAL SETTINGS' with the menu buttons P↓ or P↑ and confirm with the menu button →.
4. Select the line 'AUTO STANDBY' with the menu buttons P↓ or P↑.
5. Select 'ON' with the menu buttons ← or →. If you select 'OFF', the function will be switched off.
6. Confirm with the OK button.
7. To end, press the MENU button.

▷ A **TIMER recording** only functions when the video recorder is **switched to standby**.

The 'DEMO' function

When the 'DEMO' function is switched on and the video recorder **switched off**, several menus will be demonstrated on the TV screen. This has no influence on operating the video recorder.

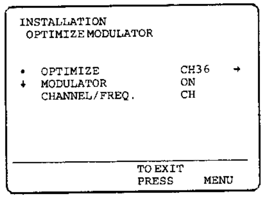
1. Switch on the TV set. If required, select the programme number for the vieo recorder.
2. Press the MENU button. The main menu appears.
3. Select the line 'SPECIAL SETTINGS' with the menu buttons P↓ or P↑ and confirm with the → button.
4. In the line 'DEMO', select 'ON' with the menu buttons → or ←.
   If you select 'OFF' the function will be switched off.
5. Confirm with the OK button.
6. To end, press the MENU button.

▷ The 'DEMO' function is not possible during a 'TIMER recording' and during an 'Automatic recording from a satellite receiver'.

Eliminating Picture Disturbance - Optimize the modulator

With 'Connecting without scart cable', UHF-channel CH36or 591MHz might already be being used by another TV station in your reception area. In this case the picture quality on your TV set will be adversely affected when receiving one or more TV channels.

1. Ensure that **no** cassette has been loaded. On the video recorder, **simultaneously** hold the STOP/EJECT■/▲ and the PLAY► button for a few seconds until e.g.: UHF-channel 'CH36' or 'M591' appears in the display. The video recorder transmits a test picture on this UHF-channel (or this frequency).



```
INSTALLATION
 OPTIMIZE MODULATOR

•  OPTIMIZE                CH36    →
↓  MODULATOR               ON
   CHANNEL/FREQ.           CH

                     TO EXIT
                     PRESS       MENU
```

2. In line 'CHANNEL/FREQ.' select the indication for channel 'CH' or frequency 'FREQ.', using the menu buttons → or ←.
3. Select the line 'OPTIMIZE' with the menu buttons P↑ or P↓. Press the menu button →.
4. When the video recorder finds a 'free' TV channel, the channel or frequency will be indicated.

▷ You can also enter the channel or frequency directly with the digit buttons 0-9.

5. Tune in the TV set in this channel or frequency.
6. Confirm the channel or frequency indicated with the OK button.
7. To end, press the MENU button.

Switching off the modulator

If you cannot eliminate picture or sound interference, you can switch off the built-in modulator. You should only do this if you have connected the video recorder to the TV set with a scart cable. 'Connecting VCR without scart cable' is not possible when the modulator is switched off.

▷ With the function 'Easy Link/NexTView' the modulator will be switched off automatically.

1. Switch on the TV set. If required, select the programme number for the video recorder.
2. Please note that **no** cassette has been inserted. Press the STOP/EJECT■/▲ and the PLAY► button **simultaneously** for several seconds until e.g.: 'CH36' appears in the display.
3. Select the line 'MODULATOR' on the TV screen or 'M ON' in the display with the menu buttons P↑ or P↓.
4. With the menu buttons ← or →, select the function 'OFF' on the TV screen or 'MOFF' (modulator off) in the display. Select 'ON' on the TV screen or 'M ON' (modulator on) in the display to switch the modulator back on.
5. Confirm with the OK button.
6. To end, press the MENU button.

Remote control of TV sets

This remote control can operate with a number of remote control commands for TV sets of different makes.
Using the **TV** button set, you can activate the following functions:

◢+/−	TV volume plus, minus
TV🔇	Switch off sound
TV⏻	Switch off TV set
P+/−	TV programme number plus, minus

1. Direct the remote control at the TV set.
2. Press the TV⏻ and the digit button **at the same time**.

Digit button	TV make
0	Philips, Radiola (F), Schneider (F)
1	Grundig
2	Panasonic
3	Panasonic
4	Sony

▷ If the selected code does not operate with your TV set, or if the TV make is not contained in the list, you can try out the codes one after the other.

Audio only record

You can use your video recorder as a HiFi tape recorder. You can record the sound from e.g. a HiFi unit or a second video recorder.

1. Use an audio cable to connect your HiFi (stereo) unit to the AUX IN L R socket at the back of the video recorder.
2. Select the programme number from which the 'only audio' recording should be made, using the P↑ or P↓ button (e.g.: 'AUX' for the AUX IN L R socket.
3. Press the MENU button. The main menu appears.
4. Select the line 'RECORD FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the → button.
5. Select the line 'AUDIO ONLY' with the menu buttons P↓ or P↑ and confirm with the → button.
6. To start sound recording, press the ●RECORD/OTR button.
7. To stop recording, press the STOP■ button.
8. To end, press the MENU button.

Manual audio control

With the MANUAL button you can switch to manual audio control.

1 Press the MANUAL button on the video recorder. The current selection appears in the display.

2 Keep pressing the MANUAL button until 'MAN' (manual audio control) appears in the display.

3 With the P↑ and P↓ buttons, adjust the recording level so that the '0dB' mark lights up during the loudest parts of the recording.

▷ With TIMER recordings and 'automatic recording from a satellite receiver' the sound is always controlled **automatically**.

▷ At step 2 you can switch back to 'AUTO.' (automatic audio control) with the menu button →.

Audio dubbing

This function enables you to replace (dub) the sound track of an existing recording with another sound track. To do this, connect an audio source (e.g.: a CD-player) to the L-AUDIO-R (programme number 'E3') socket. You can also connect a microphone to the socket MIC. (programme number 'MIC').

1 Switch on the TV set. If required, select the programme number for the video recorder.

2 Press the MENU button. The main menu appears.

3 Select the line 'RECORD FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the → button.

4 Select the line 'AUDIO DUBBING' with the menu buttons P↓ or P↑ and confirm with the → button.

5 Select the programme number for the audio source (e.g.: 'E3'). Switch on the external audio source.

6 During playback, locate the position on the tape at which the audio dubbing is to end.

7 Press the STILL/JOG ON ▶◀ button. 'STILL' appears on the TV screen.

8 Press the CLEAR (CL) button. '0:00:00' appears on the TV screen.

9 Locate the position at which the audio dubbing is to start.

10 Press the STILL/JOG ON ▶◀ button. 'STILL' appears on the TV screen.

11 Press the STOP ■ button.

12 Press the ●RECORD/OTR button. The video recorder will start to record the sound transmitted from the audio source. The normal (linear) sound track is re-recorded, the stereo sound will remain.
The audio recording stops **automatically** when the counter reaches '0:00:00'.

13 To end audio dubbing,press the MENU button.

▷ To play back the audio dubbing, read the section 'Sound track selection' in chapter 5, 'ADDITIONAL FUNCTIONS'.

Headphones volume

1 During playback, press the MENU button. The main menu appears.

2 Select the line 'PLAY FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the menu button →.

3 Select the line 'HEADPHONE VOLUME' with the menu buttons P↓ or P↑ and confirm with the menu button →.

4 Adjust the volume with the menu buttons ← or →.

5 Confirm with the OK buton.

6 To end, press the MENU button.

Selecting the sound track

You can select the required sound track. This is of particular interest when the audio transmissions are multilingual.

1 Press the SELECT button. The current setting will appear on the TV screen.

2 By pressing the SELECT button several times you can select from the four possibilities displayed ('STEREO', 'RIGHT', 'LEFT', 'MONO').

▷ During playback you can select a fifth possibility: the 'MIXED' mode. In this mode you can playback the mono sound of the normal (linear) audio track together with the sound of the stereo audio track.

▷ If there is no stereo sound recorded on the cassette, the video recorder automatically switches to mono sound.

Synchronous editing (synchro-edit)

You can synchronously copy between this video recorder and an appropriately equiped camera recorder. Both units are started at the same time with the help of a synchronous impulse and an adjustable start delay (=preroll time).

Adjusting the video recorder to the camera recorder.

1 Connect the two units with a synchro-edit cable (socket SYNCHRO EDIT on the left front of the video recorder).
Connect the video/audio source to the input sockets L-AUDIO-R and VIDEO (programme number 'E3') of the video recorder.
Please also observe the instruction manual of the camera recorder.

2 Switch on the TV set. If required, select the programme number for the video recorder.

3 Press the MENU button. The main menu appears.

4 Select the line 'RECORD FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the menu button →.

5 Select the line 'CAMERA LINK' with the menu buttons P↓ or P↑.

6 Switch the **camera recorder** to **'still picture'** (playback-pause).

7 Confirm with the menu button →. The video recorder now controls the connected camera recorder type.

8 The following message appears on the TV screen: 'VCR CONTROL DETECTED' when the video recorder controls the camera recorder or 'CAMERA CONTROL DETECTED' when the camera recorder controls the video recorder.

Starting synchro-edit

1 Switch on the TV set. If required, select the programme number for the video recorder.

2 Press the MENU button. The main menu appears.

3 Select the line 'RECORD FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the → button.

4 Select the line 'SYNCHRO EDIT' with the menu buttons P↓ or P↑ and confirm with the → button.

5 The OSD corresponding to the connected camera recorder type appears on the TV screen.

6 Search the beginning of the recording on the video recorder.

7 Press the STILL/JOG ON ▶◀ button. 'STILL' appears on the TV screen.

8 Use the SELECT button to select the OSD for the camera recorder.

9 Search the beginning of the recording on the camera recorder.
Switch the camera recorder to 'still picture' (playback-Pause).

The way copying is started depends on the camera recorder type used:
Variant 1 when the video recorder controls the camera recorder, or
Variant 2 when the camera recorder controls the video recorder.

Variant 1, the video recorder is to control the camera recorder

1 Start copying with the ●RECORD/OTR button on the video recorder.
The camera recorder starts 'PLAYBACK' and at the same time the video recorder starts 'RECORDING'.

2 Stop copying with the STOP■ button on the video recorder.

3 End copying with the MENU button.

Variant 2, the camera recorder is to control the video recorder

1 Start copying with the corresponding button on the camera recorder.
The camera recorder starts 'PLAYBACK' and at the same time the video recorder starts 'RECORDING'.

2 Stop copying with the PAUSE or STILL button on the camera recorder.

3 End copying with the MENU button.

Setting the 'preroll time'

When the beginning of the recording is missing, the 'preroll time' was too long. Select a shorter 'preroll time'.
If recording started too early, the 'preroll time' was too short. Select a longer 'preroll time'. You can select a 'preroll time' between 1:00 and 5:00 seconds.

1 Press the MENU button.

2 Select the line 'RECORD FUNCTIONS' with the menu buttons P↓ or P↑ and confirm with the menu button →.

3 Select the line 'RECORD SETTINGS' with the menu buttons P↓ or P↑ and confirm with the menu button →.

4 In line 'PREROLL TIME', adjust the 'preroll time' with the menu buttons → or ←.

▷ You can also directly enter the 'preroll time' with the digit buttons 0-9.

▷ With the CLEAR (CL) button you can reset the 'preroll time' to that of the identified camera recorder type.

5 Confirm with the OK buton.

6 To end, press the MENU button.

Before you call an engineer

If, contrary to expectation, you experience any difficulty in operating this video recorder, it may be caused by one of the reasons mentioned below. You can also call the **customer service** in your country.
You will find the telephone numbers in the enclosed guarantee leaflet.

The set does not respond to any button being pressed:
No power supply.
A programmed recording is currently being made.
Child lock is active.
Technical disturbance: disconnect from the mains for 30 seconds, then re-connect. If this does not have any effect, you can:
1. Disconnect from mains.
2. Re-connect to mains **whilst holding down** the STANDBY⏻ button on the video recorder until the message disappears from the display. All stored data will be reset (cleared).

Cassette jammed:
Don't use force. Pull out the mains plug for a moment.

Remote control does not operate:
Remote control not pointed toward the video recorder.
Batteries are exhausted. Change batteries.
Remote control command wrong. Read the paragraph 'Switching remote control command' in chapter 'ADDITIONAL FUNCTIONS'.

No playback from video recorder:
No recording on the cassette: Change cassette.
The VCR programme number on the TV set was incorrectly selected or incorrectly set: On the TV set, select the correct programme number.
The connecting cable between the TV set and the video recorder has come loose: Check cable.

Poor playback from video recorder:
TV set not properly adjusted.
Cassette badly worn or of poor quality: Use new cassette.
Tracking not properly adjusted, video heads dirty: Read the section about 'Selecting the picture setting (SMART PICTURE), as well as 'Eliminating picture disturbance' in chapter 'PLAYBACK'.

No recording possible:
TV channel not stored or wrongly selected: Check TV programmes stored.
Cassette with erase protection has been loaded: Undo erase protection.

Programmed recording does not function:
TIMER not set properly: Check TIMER blocks.
Time/date wrongly programmed: Check time/date.
A cassette with erase protection has been loaded: Undo erase protection.
'PDC' or 'VPS' switched on but 'PDC/VPS time' wrong: Enter PDC/VPS time exactly to the minute. Check aerial.

Picture or sound interference on TV reception :
Turn to Chapter 5 'EXTRA FUNCTIONS' and read in the section 'Eliminating picture interference - Optimize the modulator' and 'Switch off the modulator'.
Have your aerial checked.

Enter the serial number of your appliance here:

MODEL NO./TYPE **VR850/02**

PROD.NO.:/SER.NR. ......

This product complies with the requirements of the Directive 73/23/EEC + 89/336/EEC + 93/68/EEC.

Instructions for removal

General guidelines for removing parts of the housing, the electronics and the drive

When dismantling or assembling equipment, always ensure that the mains plug has been removed.

Due to the main voltages (hot circuit) on the primary side of the switched-mode power supply, an isolating transformer is absolutely essential for operating the device.

The drive or the combination drive –
The motherboard must not be lifted out using the transverse struts on the lift!
Components underneath the drive must be installed straight!

Troubleshooting for the power supply unit may only be carried out using a variable isolating transformer.

All screws in the video recorder can be unfastened or tightened using a 10 *) Torx screwdriver.

1. Housing cover (Fig. 1)

- Unscrew and remove the five screws (S1).
- Lift the housing cover out of the groove and slide backwards by about 4 cm.
- Push outwards the underside of the side walls in the middle by approx. 1 cm, and lift the cover upwards.

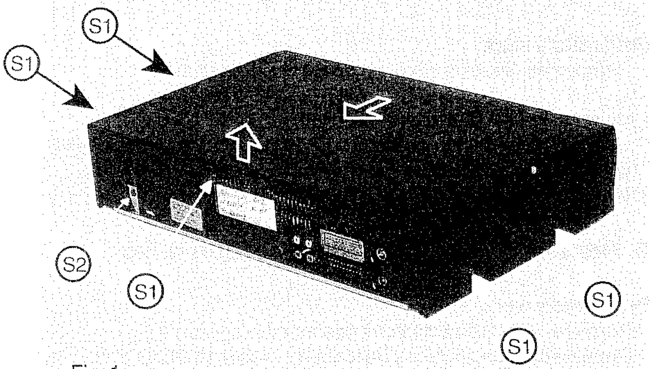


Fig. 1

Assembly:
Installation is carried out in the reverse order.

2. Floor plate (Fig. 2)

Preparatory work:
Remove the housing cover as described in section 1.

- Remove the S2 screws (Fig.1).
- Turn the unit over (bottom facing upwards).
- After unlocking the three H1 snap-on hooks from left to right, the floor plate can be pushed backwards by approx.1cm and lifted off.

This means that the most important ICs and the µP on the underside of the motherboard (MOBO) are accessible.

Installation:
Installation is carried out in the reverse sequence.

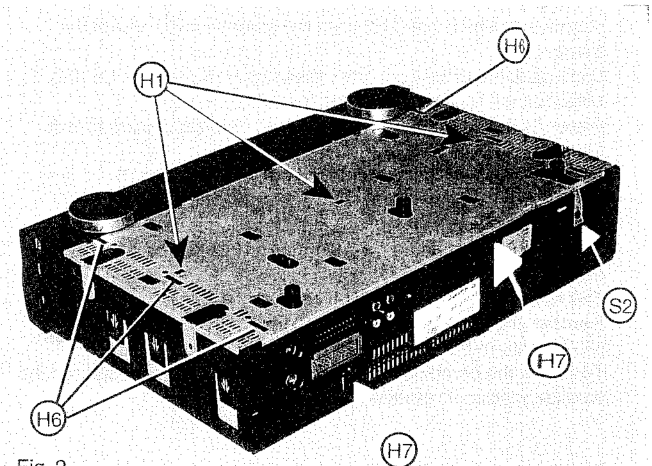


Fig. 2

3. Front panel (Fig. 3)

Preparatory work
Remove the housing cover as described in section 1.

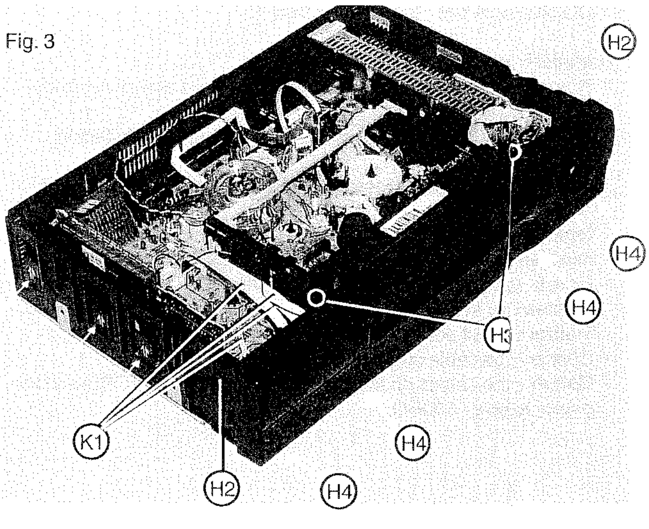
- Remove the four K1 cables from the MOBO.
- Push the two H2 snap-on hooks outwards and then push the top panel side forwards by about 2mm.
- Then unfasten the two H3 snap-on hooks on the top side.
- Finally, unfasten the four H4 snap-on hooks and pull off the front panel towards the front.

The set remains fully operable throughout this procedure.

Installation:
- Attach the front panel until the snap-on hooks engage.
- When doing this, make sure that the lift flap lever slides into the guide for the lift flap.
- Re-attach the four K1 cables on the MOBO.

Important!
- Check that all the snap-on hooks are fully engaged and that all the cables have been inserted!

Fig. 3



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*) ... available from specialist outlets

4. Control printed board - ADCP / ACP

Preparatory work

Remove the housing cover as described in section 1.
Remove the front panel as described in section 3.

- Unfasten the eight S3 screws and lift off both boards.
- The shuttle knob can simply be taken off.

5. Power supply unit (Fig.1; Fig. 4)

Preparatory work

Remove the housing cover as described in section 1.

- Remove the S2 screws on the power supply unit (Fig.1).
- Unfasten the H5 snap-on hooks (Fig. 4) and lift the power supply unit out of the groove.

Installation is carried out in the reverse sequence.

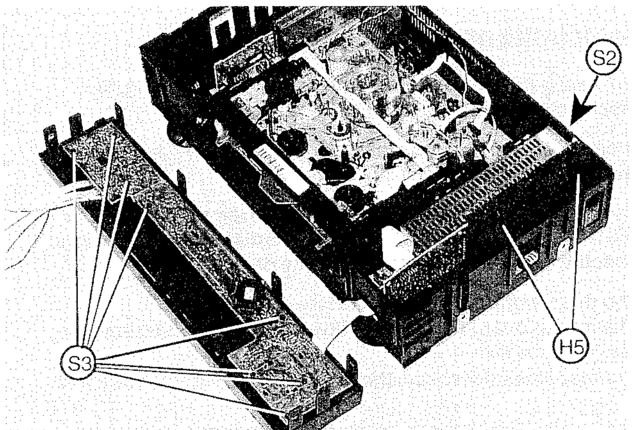


Fig. 4

6. Removing the MOBO combination drive

Preparatory work

Remove the housing cover as described in section 1.
Remove the front panel as described in section 3 and pull out the cable from the MOBO.
Remove the power supply unit as described in section 5 and pull out the cable from the MOBO.

- Remove the three fixing screws (F) in the MOBO (Fig. 5), although these screws are not absolutely necessary thanks to the design.
- Remove cables K2 and K3 from the guides on the rear of the frame.
- Slide back the lift by 5cm after releasing both lift locks LS (Fig. 5).
- Unfasten the four screws S4 on the driver (Fig. 5)
- Break off the four plastic parts sprayed onto the groove to lock the snap-on hook (Fig.3).
- Turn the unit over (bottom side facing upwards) (Fig.2).
- Fix the four H6 snap-on hooks in the open position using the plastic parts (Fig. 2).
- Unfasten the remaining two H7 snap-on hooks and lift up the frame (Fig. 2).
- The frame can now be lifted off carefully.
- Remove the four plastic parts from the groove again and DO NOT put them back into the unit.
- Turn over the combination MOBO drive carefully, and place in the service position if necessary (Fig. 6).

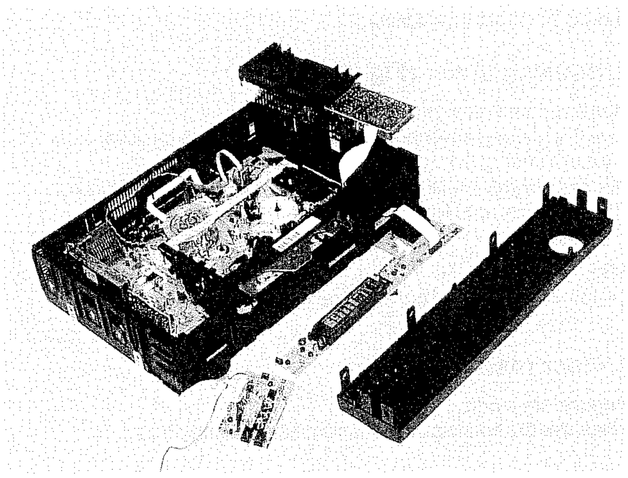
The device is operable in this position.
DO NOT use the „Eject“ function !!!

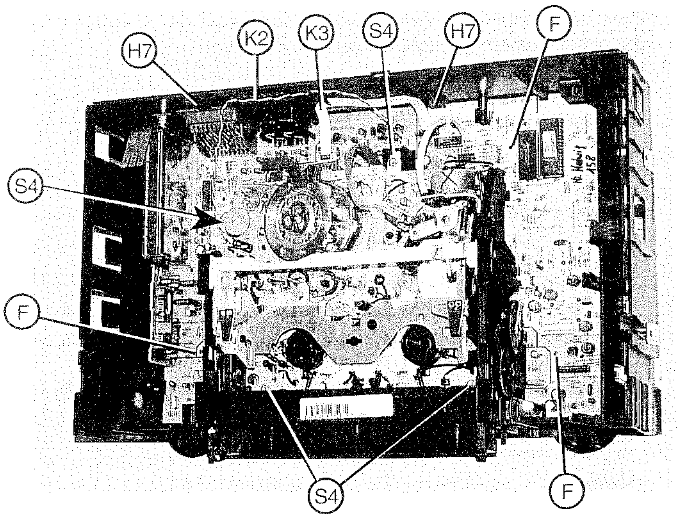
Caution:

No playback adjustments may be made in the service position.
DO NOT use the „Eject“ function !!!

Installation:

- Remove the cable to the control printed board and power supply unit from the MOBO.
- Place the frame on a level surface with the open side facing upwards.
- Grip the drive **at the sides** by the lift and place the MOBO drive unit into the frame.
- Make sure that the cinch socket and the scart socket are inserted into the guides.
- Check that all the snap-on hooks on the MOBO are engaged!
- Tighten any screws (F) (Fig. 5).
- Tighten the S4 screws on the drive again (Fig. 5).
- Connect the cable once more.
- Connect the cables on the control printed board - MOBO and the power supply - MOBO.





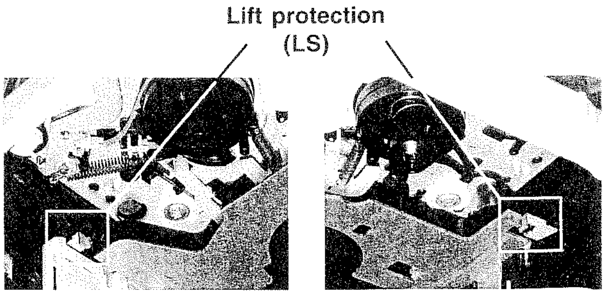


Fig. 5

7. Removing the drive (Fig. 5)(Fig. 6)(Fig. 8)

Preparatory work

Remove the housing cover as described in section 1.
Remove the front panel as described in section 3.

- After releasing both lift locks, slide back the lift by 5 cm.
- Undo and remove the four fixing screws (S4) on the drive.
- Undo and remove the earthing screw (M) on the underside. (To do this, insert the screwdriver through the hole in the rear panel.) (Fig. 8)
- Remove all cables from the drive.
- Bend the screening panel on the scanner cable backwards.
- Remove the scanner cable from the plug.
- Move the lift back to the „Eject“ position.
- Lift the drive backwards slightly to unfasten the plug connection to the capstan motor.
- Press together the two snap-on hooks (S) using pointed pliers and lift up the drive near the snap-on hooks (Fig. 7).
- The drive can now be separated from the MOBO.

Installation:

Installation is carried out in the reverse order.

Important

Make sure that the cables (K1; K2;) are positioned in the mounts on the rear of the frame, and that the earthing screw (M) is screwed on!

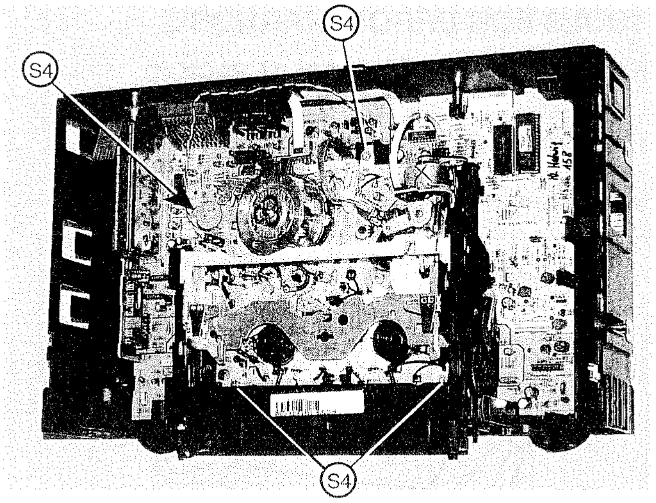
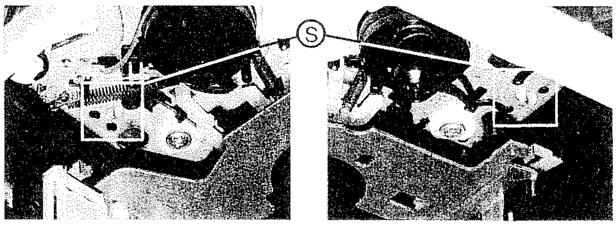


Fig. 7



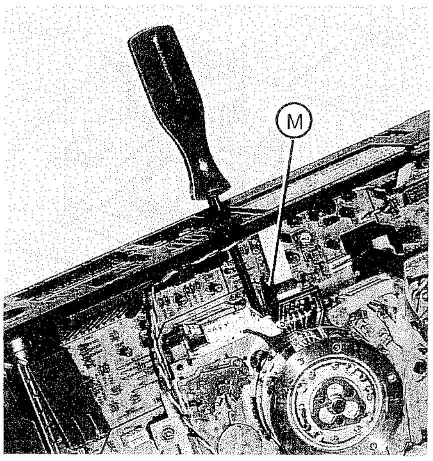


Fig. 8

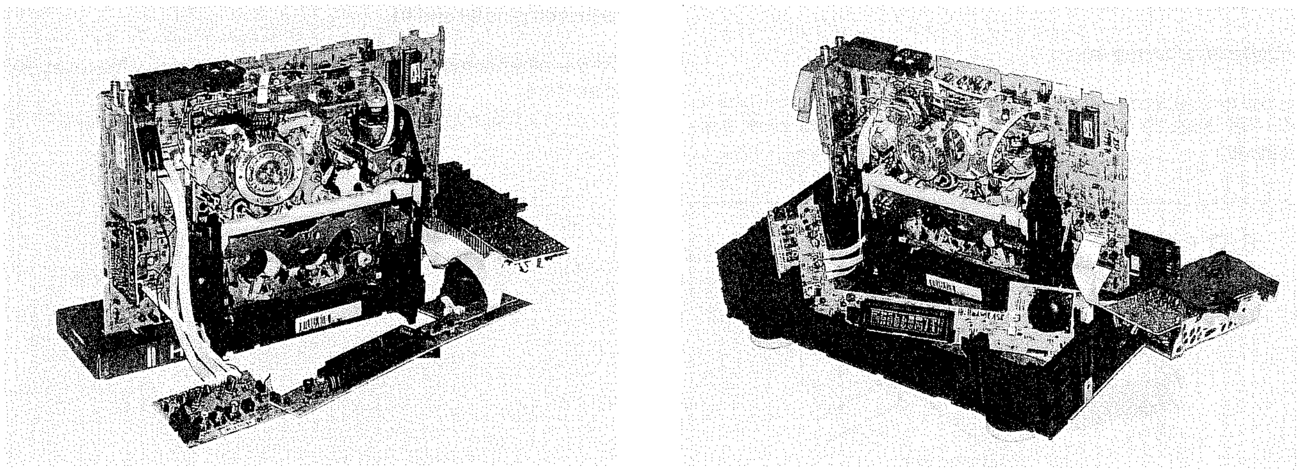


Fig. 6

TOOLS FOR ERROR DIAGNOSIS

How to remove/install the FLAT PACK IC

1. How to remove a Flat Pack IC

Using hot air Flat Pack IC unsoldering equipment

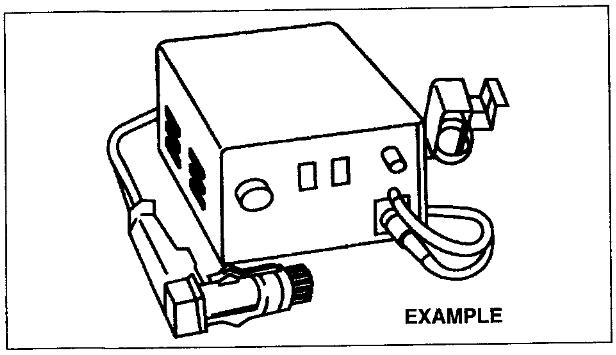


Fig. 2-1

a. Prepare the hot air Flat Pack IC unsoldering equipment. Then apply hot air to Flat Pack IC for 5 - 8 seconds.

b. Remove the Flat Pack IC with tweezers after applying the hot air.

CAUTION: To avoid damage, do not apply the hot air to the chip parts around the Flat Pack IC for long periods.

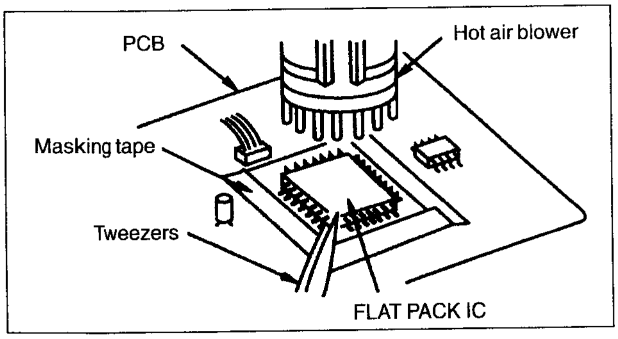

PCB
Hot air blower
Masking tape
Tweezers
FLAT PACK IC

Fig. 2-2

Protect adjacent parts with masking tape.

Flat pack ICs are fixed to the PCB with glue. When removing it, take care not to break or damage any foil under the IC or near the soldering eyelets.

If a knife, thin screwdriver, etc. is required to remove the control/deck µP pos. 7406, it should only be used on the corner between pins 90 and 91.

• Using a soldering iron

a. Use an unsoldering braid to remove the solder from all the pins on the Flat Pack IC. Apply solder flux to all the pins to allow easy removal.

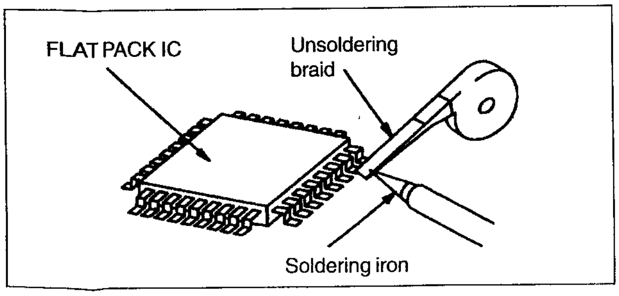

FLAT PACK IC
Unsoldering braid
Soldering iron

Fig. 2-3

b. Lift up each individual pin using a needle or a piece of iron wire whilst heating the pins using a fine tip soldering iron or a hot air blower.

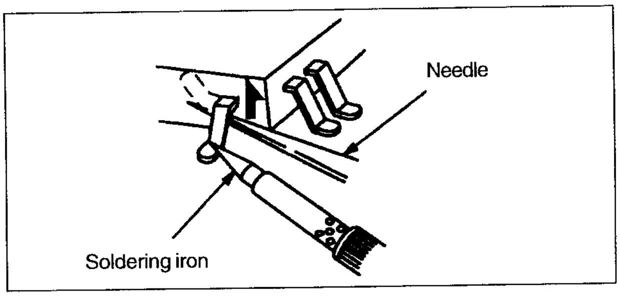

Needle
Soldering iron

Fig. 2-4

• Using iron wire

a. Use an unsoldering braid to remove the solder from all the pins on the IC. Apply solder flux to all the pins to allow easy removal.

b. Affix the wire to the work surface or to a fixed anchorage point (see fig. 2-5).

c. Pull the wire upwards as soon as the solder melts to release the pin on the IC from the PCB contact pad, whilst continuing to heat the pins using a fine tip soldering iron or hot air blower.

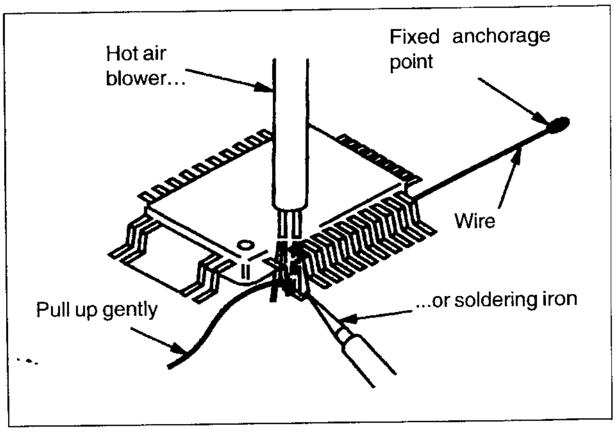

Hot air blower...
Fixed anchorage point
Wire
Pull up gently
...or soldering iron

Fig. 2-5

Note:
If the IC is glued, heat it first using a hot air blower to melt the glue.

CAUTION:
If a knife, thin screwdriver, etc. is required to remove the control/deck µP pos. 7406, it should only be used on the corner between pins 90 and 91.

At the other corners there are printed conductors which may be damaged!

- ***Using a special solder removal device***

a. Apply extra tin-lead solder onto the pins

b. Heat the IC to melt the glue which has been used to affix it

c. Use a solder removing device with a special punch which matches the contours of the IC to remove the IC.

If a knife, thin screwdriver, etc. is required to remove the control/deck µP pos. 7406, it should only be used on the corner between pins 90 and 91.

At the other corners there are printed conductors which may be damaged!

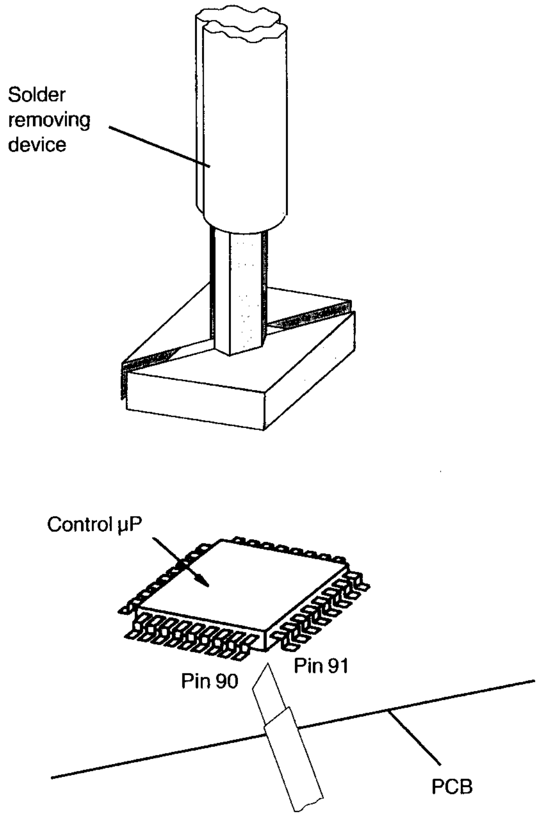

Solder removing device
Control µP
Pin 90
Pin 91
PCB

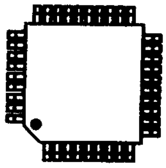
Fig. 2-6

2. How to install the FLAT PACK IC

a. Use an unsoldering braid to remove the solder on the soldering eyelets on the PCB. This makes it easier to install the new FLAT PACK IC.

b. The "•" mark on the IC indicates pin 1.
Make sure this mark matches contact 1 on the PCB. Solder the four corners of the IC (see fig. 2-7).

EXAMPLE



Pin 1 on the FLAT PACK IC is identified with a "•" mark.

Fig. 2-7

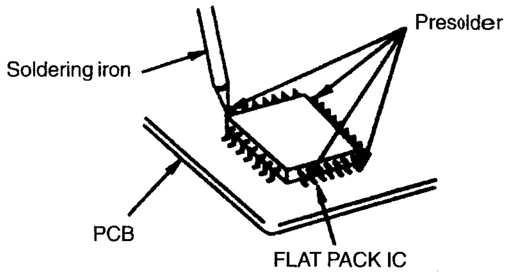

Soldering iron
Presolder
PCB
FLAT PACK IC

Fig. 2-8

c. Apply extra flux onto the pins

d. Solder all the pins on the FLAT PACK IC

e. Remove excess tin-lead solder using an unsoldering braid. Make sure that none of the pins have solder bridges between them.

Note
All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described in the "Safety instructions" section of this manual.

Voltage measurements

Colour bar signal in RECORD and PLAY modes at normal speed.

Note:
The voltages for REC. and PLAY are given on the schematic diagrams in the figure below.

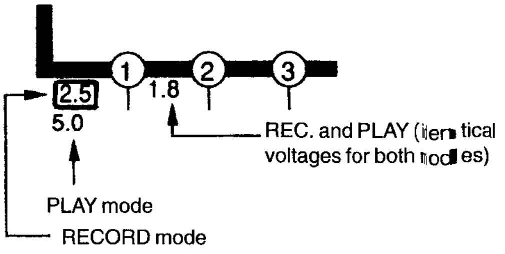

1
2
3
2.5
1.8
5.0
REC. and PLAY (identical voltages for both modes)
PLAY mode
RECORD mode

Fig. 2-10

2. TOOLS FOR ERROR DIAGNOSIS

2.1 Erasing the EEPROM

- Disconnect from the mains
- Press and hold down the Standby key, reconnect to mains and keep the Standby key depressed until the display illumination is switched off (approx. 8 sec.)

All EEPROM data will then be erased and initialised (timer and transmitter channels). The internal processor Ram is also erased, but the option codes, deck parameters, operating hours counter and adjustment values are maintained.

2.2 Changing the EEPROM

After changing the EEPROM the following steps must be carried out:

Step 40: Option code entry
Step 51: Setting the vertical head switching position
Step 52: 'Studio Picture control' adjustment
Step 53: Clock adjustment
Step 60: Level adjustment stereo decoder
Step 61: Channel separation stereo decoder
Step 62: Audio linear playback level
Step 63: Bargraph level

2.3 Service Test Program

2.3.1. Introduction

The software program for the microprocessors includes a service test program. It is divided into the following steps, with the following 'modes':

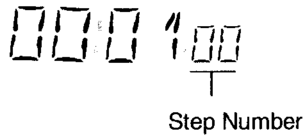
Step	**Name**
00	Mask version
01	Deck position
02	Deck error code
03	Deck sensors and manual tracking
04	Operating hours
05	Device check
10	Operation without tape deck - dummy mode
40	Option setting
51	Vertical head switch. pos. adj.
52	SPC adjustment
53	Clock adjustment
60	Level adj. stereo decoder
61	channel separation
62	Audio linear playback level adjustment
63	Bargraph level
95	EEPROM read/write
98	Display test
99	Clock measurement

The functionality of the set during service mode differs from the normal operation:

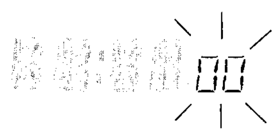
- All deck modes are available.
- Childlock is deactivated after calling up and exiting the service mode.
- There is no Autostandby and Autotracking. Tracking always in middle position except step 3.
- No menu and therefore no tuning.
- No preset change with UP/DOWN possible. The preset number which was set upon entering the service test program is maintained.

2.3.2. Activating and leaving the service test program

Press and hold down the 'STOP' key on the remote control. Then press the 'PLAY' key on the recorder and keep both keys depressed for at least 5 sec.
After calling up the service test programme, Step 00 is automatically displayed with the mode 'mask version number'.



To change a step press key 'SELECT'. After this the display shows flashing the actual step number. All step modes may be selected with UP/ DOWN or digit entry. To enter and to activate the new step number press key 'SELECT'.

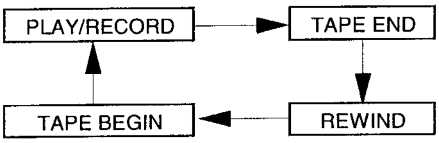


If you have entered an unknown step number the display will show flashing '--'

To leave the service program, press the STANDBY key or disconnect recorder from mains.

2.3.3. Continous test

In the service test program, the recorder can be put to a continous test. For this, use a cassette and activate 'PLAY' or 'REC'. The functions are then repeated continuously. In RECORD, the recorder does not go to EJECT at the tape end, but to REWIND, after which it starts RECORD again. This test serves to detect intermittent faults. The last deck-error is stored in the EEPROM. (The fault remains stored even after a power interruption.)
The continous test is ended by pressing 'STOP' or leaving the service test program.

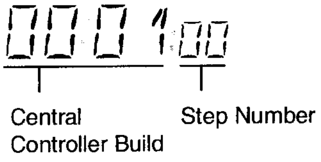

PLAY/RECORD
TAPE END
REWIND
TAPE BEGIN

2.3.4. Description of steps:

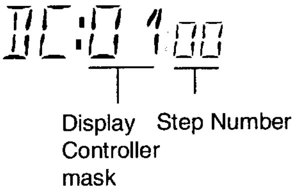
Step 00: Display of mask version numbers

After activating the service test program, Step 00 with the mode mask version number is automatically displayed.

a) After calling up the service test programme, the version ('build') number of the control microprocessor is displayed,

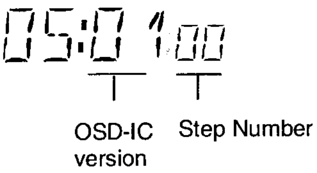

0001 00
Central Controller Build
Step Number

after pressing the 'DOWN' key,
b) the mask number of the Display Controller is displayed

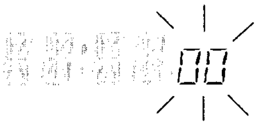

dC:01 00
Display Controller mask
Step Number

Pressing 'UP' goes back to the Central Controller mask number.

After pressing the 'Down' key again
c) the mask version of the On Screen Display IC is shown:


OS:01 00
OSD-IC version
Step Number

This mode can be left again by pressing the 'SELECT' key on the remote control. The currently selected step number appears and flashes on the display.



A step between 00 and 99 can now be selected.

Step 01: Checking the drive positions

By calling up Step 01, the drive position appears on the display.
The drive position which is linked with the count of the FTA pulses of the loading tacho is shown as a 3-digit decimal number.
(e.g. 07 = Eject)

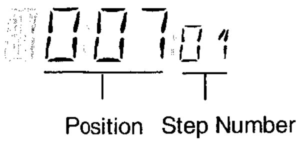


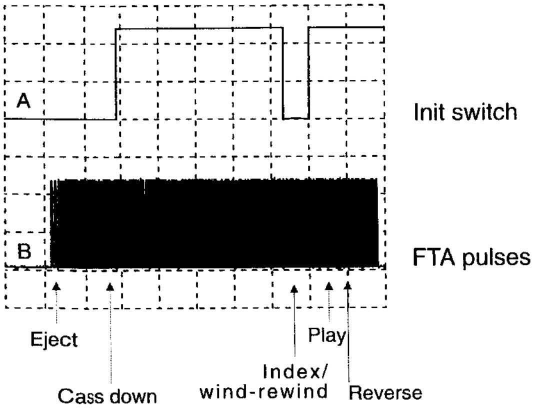
Table of drive positions:

Status	Position	Position
	no Jog/Shuttle	Jog/Shuttle
Eject	7+2-2	7+2-2
Index	191+0-2	191+0-2
Stop out	200+4-4	200+4-4
Play	214+4-4	211+4-4
Reverse	237+2-0	237+2-0

Function of the Init switch:

The diagram shows the function of the Init switch, depending on the position of the drive.

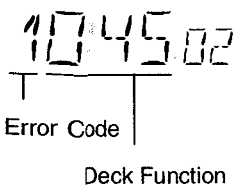
A: DC, 2 V/Div, 0.5 s/Div
B: DC, 2 V/Div, 0.5 s/Div



Step 02: Display of the deck error code

In this step the last 3 deck error codes are displayed. On entry the display shows the last deck error code.
The deck status in which the error occured is shown with 3 digits.
The error codes remain in the EEPROM, even if the recorder is disconnected from the mains.

With the DOWN key you can select the other 2 errors; with UP you can go back to the last error again.



Remark: When a series of errors occurs, only the first error is displayed; i.e. when the deck µP detects a head motor error and wants to eject the cassette but the eject cannot be performed then the head motor error is displayed and not a threading error.

Error table:

0	no error
1	threading error
2	no capstan pulses
3	tape broken
4	no pulses left reel
5	no pulses right reel
6	head motor error

Function table:

12	Standby	115	Viss erase	215	Slow motion 1/7
14	Autotracking	125	Tuner - Stopout	216	" " 1/2
31	Play*-3	126	Auto Remain Function	217	" " -1/24
34	Slow_reverse	130	ATTS Function	218	" " -1/14
41	Still Picture	168	Frame+	219	" " -1/7
42	Fast	169	Frame-	220	" " -1/2
44	Play*-9	170	Play*-11	222	Edit Record
45	Eject	171	Play*-7	223	Auto align of Head sw. Pos
46	Play*9	172	Play*-5	225	Autotracking Abort
47	Play*-1	173	Play*5	238	Pause
48	Pause	174	Play*7	239	SPC align
50	Rewind	175	Play*11	246	Edit Pause
52	Wind	196	Tuner - Eject	247	Slow motion 1/10
53	Play	197	Standby Eject	248	" " 1/18
54	Stop out	199	Audio Dubbing	249	" " -1/10
55	Record	202	Audio Dubbing Pause	250	" " -1/18
112	Index next	206	Reset Tapecounter	253	Key Released
113	Index previous	211	Slowmotion 1/24		
114	VISS write	212	Slow motion 1/14		

To clear all error codes press CLEAR.
After doing this the display shows:

00 12:02

Checking the drive functions:

Time for loading and unloading
The signal of the photoelectric barrier which controls the revolutions of the loading motor is used as a reference for the loading and unloading time.

Stopping of the left or right winding disk
The tacho signals of the left (WTL) and right (WTR) winding disks are used as a control reference.

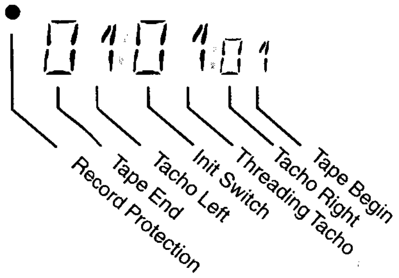
Stopping of the head motor
This is monitored with the PG/FG signal. The signal is derived from the e.m.f. of the non-conducting windings of the head motor, showing the speed and position of the head drum.

Capstan motor fault
This is monitored with the capstan tacho signal.

If one of the above sensor signals is not available, the recorder tries to put the lift to the 'EJECT' position.

Step 03: Deck sensors and manual tracking

The display shows the deck sensors and will be updated periodically.



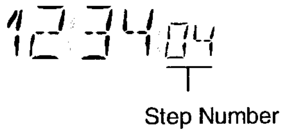
Icon '●' is used to display the status of the record protection (icon lighted means record protection active).
The actual deck status is shown as icon in dot matrix i.e. ▶ ■ ❚❚ ● ⏩ ⏪ ◀

Tracking:

In the service test program, the tracking is always set to the centre position. Only in this step the tracking value can be changed with the UP / DOWN keys for necessary tape adjustments (X distance).
After leaving the mode by pressing the SELECT key, the tracking value always resets itself to the centre position and cannot be changed.

Step 04: Display of the operating hours counter:

By activating Step 04, the operating hours counter shows how many hours the head disk has turned. The hours are displayed as a 4-digit decimal number.

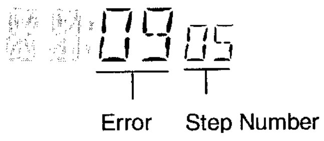


Step 05: Bus communication error

By activating Step 05, the error code of the malfunctioning or missing IIC - component is displayed.

However, if the **EEPROM** does not acknowledge at boot time the machine does not continue to boot but displays the **error code '301-73'** in the display instead. After five seconds the machine trys to reboot. This results in an endless loop if the EEPROM is defective.

An **EEPROM Read/Write Check** is executed upon entry of service step 5.
Due to the programming time of the EEPROM the EEPROM Read/Write check may take several seconds (depending on the size of the EEPROM). If during this time the VCR is interrupted (e.g. by means of a mains reset) part of the EEPROM data may be corrupted.



By pressing the DOWN key, all error codes can be selected in succession. If a version does not contain the IIC bus component, this is also shown as an error. (a fault of the Luminance/Chroma/Audio-processor 7005 cannot be displayed)

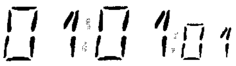
Error code table:

Code	Description	Pos.
0	no error, all expected devices are available	
1	Tuner	7702
2	Modulator	7702
5	OSD/PDC/VPS	7851
7	Audio Processor: no Acknowledge	7651
8	Videomatrix	7506
9	Nicam	1972/7700
10	Stereo Decoder	7771
11	TXT data slicer (not used)	7871
13	EEPROM read/write error	7401
14	Audio Processor: no HP2 detected	7651

Step 10: Operation without drive - dummy mode

Enter the mode by pressing the SELECT key. All motors are then switched off and the sensors will be ignored by the deck microprocessor. The drive can now be dismantled from the motherboard (see dismantling instruction). **When mounting the drive ensure that the mains is disconnected!** For signal tracking, the recorder can be set to all drive conditions, i.e. signal electronics, audio and IO processing are switched to the corresponding operating mode.

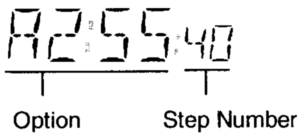
●



The step has to be left with mains interruption.

Step 40: Option code input

If, as part of repair work, a new EEPROM is installed, it has to be initialised.
After activating Step 40, option A appears in the display.



The available options can be selected with the UP and DOWN keys.

By entering a 3-digit decimal code, the correct options (features) are set. The codes are listed on the type plate of the set.
By using the 'CLEAR' key on the remote control, incorrectly entered values can be cancelled.

After pressing the 'OK' key, the entered codes are saved and 'OK' appears on the display for approx. 5 sec.

Step 98: Display Test

After activating Step 98, all display sections are illuminated with half the brightness.
The step has to be left with mains interruption.

2.4. Customer Service Mode (CSM)

2.4.1 General

Answering customer questions on the phone is a lot easier if the customer could be more specific about his problem. Once the Customer Information Center CIC knows the problem in the most cases the answer is easy. The Customer Service Mode helps customers to be more specific in their questions by providing them with a built in menu driven on-screen diagnostics system. It therefore helps dealers and CIC to provide fast and correct answers via phone.

The system enables:

- Easier handling of non-technical calls.
- More reliable information to the customer that a repair action is necessary.
- Identification of software versions via phone.

The Customer Service Mode is a read only, menu based information system which can be called up by the customer at home.

2.4.2 Calling up the Customer Service Mode

To enter the customer service mode press first STOP on the set and then MENU on the remote control and keep the keys depressed for a period of 5 seconds.
This procedure works independently of the status of Child Lock (if this feature is available) or the VCR adress.

2.4.3 Operation inside the CSM

All deck functions are possible. Functions which need a menu are not allowed.
By the help of the cursor up/down the customer can step through all stored programs.
Toggling between two tables is possible by pressing the MENU button on the remote control.

2.4.4 Deactivation

The customer can deactivate the Customer Service Mode by pressing 'STANDBY' on the VCR.

2.4.5 Contents of the Customer Service Mode

Table 1

```
CUSTOMER SERVICE MODE 1   XX:XX

VERSION    CC XXXX DC XX
DECKERR X X X ER XX XX XX XX XX
RPROT XXX CHILDL XXX  P 50  XXX
DREC  XXX DEC XXX     16:9  XXX
VCR X     REMOTE X    CASS XXXX
PROG XX SYSTEM XXXXX NAME XXXXX
TUNE XXXXXXXXX MOD XXXXXXXXXXXX

MODE XXXXXXXXXX XX PREROLL X:XX
AUDIO XXXXXXXX     HEADPHONE XX
VIDEO XXXXXXXX
WARNING XXXXXXXXXXXXXXXXXXXXXXX
```

XX:XX	Actual time
VERSION CC	Version number of central control
DC	Software version of display controller
DECK ERR E1..3	Deck error code; for an overview of the codes see Step 2 of Service Test Program
ER 0...15	Electrical Error Code according Step 5 of Service Test Program
VCR = 1 / 2	VCR adress
REM = 1 / 2	Last detected remote adress
CASS	Cassette length
RPROT = ON/OFF	Record Protection
CHILDL = ON/OFF	Child Lock
P50 = -/1/2	Easy Link not / release 1 / release 2 active
DREC = ON/OFF	Direct Record
DEC = ON/OFF	Decoder
16:9 = ON/OFF	16:9 screen aspect ratio identification
PROG	program number
SYSTEM	in REC/EE received colour system, in playback system from tape
TUNE	Frequency or Channel (dependent on actual selection) + optional value of fine tuning
NAME	Detected transmitter name
MOD	Modulator 'ON/OFF' or 'NO' in case of RF booster, frequency, audio mode G/K
MODE	Tape deck mode, Record Modes..., last 2 digits: SPEED = SP/LP
PREROLL	actual detected preroll value (default value in case no camera connected)
AUDIO	in Playback: MONO - L - R - ST - MIX; in Record or EE: AUTO/MAN and level value
HEADPHONE	Actual volume value
VIDEO	Smart picture info
WARNING	Last warning info

Table of electrical Error-Codes:

Code	Description	Pos.
0	no error, all expected devices are available	
1	Tuner	7702
2	Modulator	7702
5	OSD/PDC/VPS	7851
7	Audio Processor: no Acknowledge	7651
8	Videomatrix	7506
9	Nicam	1972/7700
10	Stereo Decoder	7771
11	TXT data slicer (not used)	7871
13	EEPROM read/write error	7401
14	Audio Processor: no HP2 detected	7651

Table of Deck Error-Codes:

0	no error
1	threading error
2	no capstan pulses
3	tape broken
4	no pulses left reel
5	no pulses right reel
6	head motor error

Table 2

```
CUSTOMER SERVICE MODE 2   XX:XX

YEAR XXXX   MONTH XX   DATE XX
 DATE  PROG  START V/P END   LP
1XXXXX XXXXX XX:XX  X  XX:XX  X
2XXXXX XXXXX XX:XX  X  XX:XX  X
3XXXXX XXXXX XX:XX  X  XX:XX  X
4XXXXX XXXXX XX:XX  X  XX:XX  X
5XXXXX XXXXX XX:XX  X  XX:XX  X
6XXXXX XXXXX XX:XX  X  XX:XX  X


V/P DET XXXXX
```

Actual time, year, month, date

– Actual timer settings

– V/P: VPS/PDC detection of actual received transmitter 'ERROR/ VALID'

Circuit descriptions

1. Switched-mode power supply PS

1.1 Technical data

Mains voltage:	220-240 V ac ±10 %
Maximum output:	40W
Operating frequency:	55 kHz
Efficiency:	approx. 80 % at max. output

1.2 Functional principle (blocking oscillator)

During the conductive phase of the switching transistor, supply energy is transferred into the transformer. This energy is passed to the secondary part in the blocking phase. Using the switch-on time, the energy transferred in every cycle is regulated in such a way that the output voltages are unaffected by changes in the load or input voltages. The Mosfet [7150] is controlled by the IC [7151].

1.3 Low power stand-by mode

In 'low power standby mode', a large percentage of the 5V load, the 12V supply and the 33V supply on the motherboard is switched off. The power supply then operates with reduced operating frequency (approx. 35 kHz) to reduce the switching power losses in the Mosfet [7150].

The power input is less than 4 Watts in this condition.

1.4 Point of reversal

Maximum output is transferred at this point of the output characteristic.

1.5 Overload:

The power supply operates in Burst Mode. The energy is limited in every cycle, so that the output power is low **(Fig.1)**.

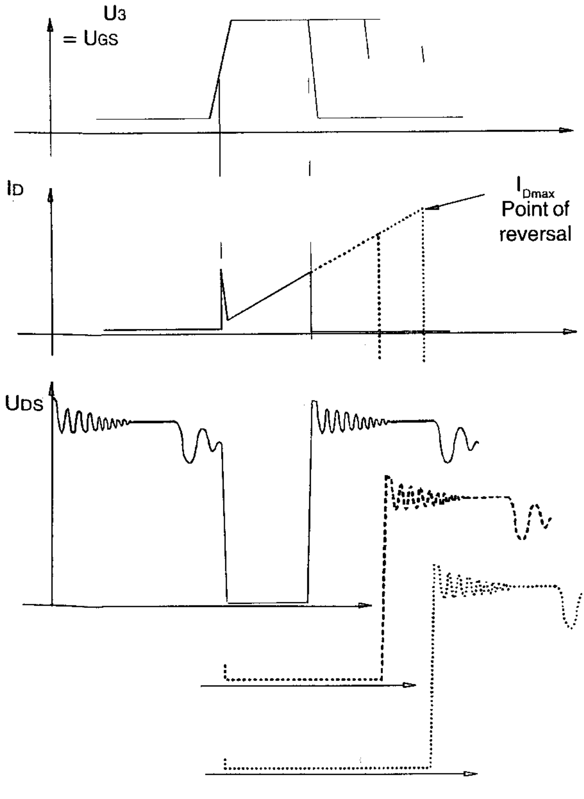


Fig.1

1.6 Circuit description:

There is a filter [5150, 2150] in the supply voltage part, which protects the power supply against any interference from the mains. The mains voltage is rectified by the bridge rectifier [6151, 6152, 6153, 6154] and buffered by electrolytic capacitor [2152]. Electrolytic capacitor [2154] is loaded using charge pumps [2151, 6155, 6156] and [3155] and is used to supply the IC [7151] during the start-up phase. After this, the IC is supplied by transformer coil 1-7 with diode [6157]. During the switch-on time of the switching transistor, a current flows from the rectified supply voltage through the primary coil of the transformer, the transistor and the shunts 7150, 3113 to earth. As the positive voltage at pin 3 of the transformer is constant (for this exercise), the current increases linearly and forms a ramp, depending on the mains voltage and the inductivity of the primary coil (U=L*di/dt). A magnetic field representing a certain volume of the primary current is formed inside the transformer. The secondary voltages are polarised in such a way that the diodes block during this phase. A voltage image of the primary current is passed to pin 7 of the IC [7151] via resistors [3160,3161]. This is checked and, as soon as it reaches a certain value, depending on the control voltage at pin 14 on the IC, the transistor [7150] is switched off.

Once the switching transistor [7150] blocks, no more energy is transferred into the transformer. The inductivity of the transformer now attempts to maintain the current which flowed through it at a constant level. The current, however, decreases (di/dt < 0) and the polarities of the voltages at the transformer reverse, causing a current to flow through the secondary coils of the transformer, the secondary diodes [6164, 6165, 6166, 6169 6170/6171] which are now conductive, and the load. This current is also ramp-shaped but decreasing.

The output voltages in the switched-mode power supply are controlled by changing the length of the conductive phase of the switching transistor [7150] so that either more or less energy is transferred from the supply to the transformer. The control information is provided by the control element [7153]. This element compares the 5V output with an internal 2.5V reference voltage using a voltage divider. The output voltage of [7153] is passed to pin 14 on the IC [7151] via an optocoupler (for galvanic isolation). It compares this voltages with an internal reference. The resulting value is compared with the voltage on pin 7 (equivalent to the primary current). The voltage on pin 5 of the IC [7151] is required for FOLD BACK in case of overloading. The maximum available secondary power is determined by resistors [3113, 3160, 3161]. If the voltage on pin 7 of the IC rises to a certain value (typ. 1V), the power supply enters the reversal point, and power limiting is activated.

Six voltages are made available on the secondary side, which are rectified by [6170/6171, 6169, 6167, 6166, 6165, 6164]. The motor voltage 8-17M2 is switched over with the control line CSW and transistors [7158, 7159].

1.7 Description of the start-up phase

After connection to the mains, the following voltages at the connections on the IC [71511 (Fig.2) rise at time to Vcc (pin1) corresponding to the half-wave loading via charge pumps [2151, 6155, 6156] to Vccstart. In this case, the current input is typically 0.3 mA. The IC starts to function when Vccstart is reached (approx. 1 4V), the power intake of the IC then rises to approx. 17 mA. The operating frequency is determined by the capacitor on pin 10 (approx. 55 kHz).

If Vcc drops below the limit value Vdis2 (typ. 9V) before the reversal point has been reached (e.g. with various short-circuits), or if Vcc rises to Vccprot (typ. 16V, e.g. if the control loop is interrupted), the output on the IC (pin 3) is blocked. The IC then attempts to re-start **(Fig. 2)**.

Attention: The power supply needs a minimum load of 200mA on the 5V output to start up.
Is the load less than the 200 mA (e.g. defective 5V fuse on the motherboard or the cable from the power supply is not connected) the power supply switches to the 'Bust' or 'Hick up' mode.

Start Up and Overvoltage protection:

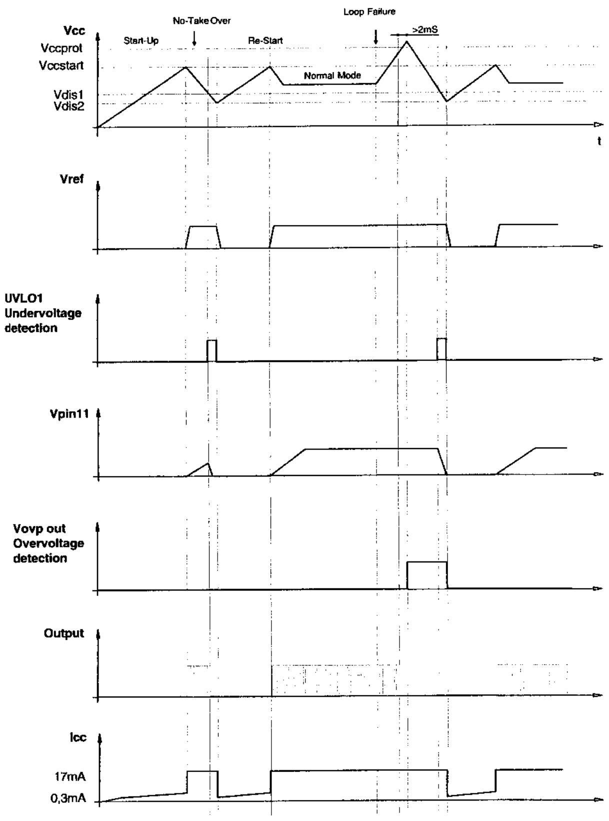


Fig.2

1.8 Normal operation, overload, standby

After start-up, the IC [7151] is in normal mode. The voltage at pin 14 is typically 2.5V. If the load increases on the power supply output, the IC increases the switch-on time for the Mosfet [7150]. The peak voltage value at pin 7 (equal to the primary current in the transformer) also increases. If the load continues to rise, the IC limits the switch-on time for the power transistor [7150] typically from 1 Vpeek at pin 7 on the IC (reversal point).

The IC power supply Vcc from transformer coil 1-7 acts as the secondary voltages. This means that Vcc also reduces with increasing load. When Vcc < Vdis1 (typ. 9V) the IC goes into Burst Mode. The short-circuit power is low, as the interval between the start-up attempts is great.

The switch-on time is shortened if the load is decreasing. If the load continues to decrease, the IC switches the frequency back to approx. 25 kHz (Standby Mode) from a certain voltage threshold at pin 7. This reduces the switching power losses on the transistor.

1.9 Overheating

The IC [7151] contains overheating protection which blocks the output stage if the chip temperature is too high (typ. 155 ºC). The attempt can be made to re-start once the temperature has been reduced.

2. Front end FV and stereo decoder FM_STEREO

2.1 Functional groups

- TUMOD = Tuner + Modulator
- IF amplifier & video demodulat with FM and AM demodulator
- FM stereo decoder TDA 9840
- NICAM decoder SAA 7283/84

2.2 Systems which can be received

- PAL B/G with FM stereo
- PAL 1 or PAL BG with NICAM stereo
- PAL BG with NICAM and FM stereo
- PAL BG/I SECAM L/L' with NICAM and FM stereo
- PAL BG SECAM DIK with FM stereo

All front end variations conform to the EN 55020 standard.

2.3 Tuner/modulator with passive loop through (TUMOD)

Tuner and Modulator are fitted into the same housing. Both the tuner and the modulator are PLL-controlled. The reception frequency or modulator frequency is set using the IIC bus.

The HF loop through to the TV unit is also ensured in LOW POWER MODE (without supply voltage) (PASSIVE LOOP THROUGH).

The amplification is determined by the AGC voltage at pin5 [1701] (for operation, see AGC section).

2.4 IF selection

The intermediate frequency of the picture carrier is 38.9 MHz for all systems except SECAM L' (33.9MHz).

A quasi-split sound system (QSS) is used for all FE variants; i.e. separate surface wave filters (OFW or SAW...Surface Area Wave) are required for the picture and sound carrier [1701,1702].

The sound used OFW (K9456M and K9463M) have two different filter characteristics which can be switched.

For the PAL BG/I-SECAM L/L' variant, an additional circuit for suppressing the adjacent channel sound carrier is provided, which is set using coil [5704] to maximum suppression at 40.4MHz.

2.5 IF demodulator

2.5.1 TDA 981 3T

There are separate internal modules for processing the IF signal for picture and sound.
The output signal of the OFW is initially amplified and then synchronously demodulated. The carrier required for this purpose is regenerated from the input signal via a PLL. The integrated VCO oscillates at double the picture carrier frequency (77.8MHz) and this frequency is set internally. The loop filter for the PLL is connected on pin 5. At pin 20, an AFC voltage (Automatic Frequency Control) is available, which is evaluated for station tuning.
At pin 18, there is a demodulated video signal and the sound carrier at 5.5MHz or 6.0MHz (FM sound) or at 6.552MHz or 5.85MHz (see NICAM sound). After a sound trap, the video signal passes to an internal 6dB buffer (pin 19). A voltage divider and an emitter follower for level adaptation (1 Vpp) are arranged at the output of the buffer (pin 8).
The IC has an output for the sound carrier at 5.5MHz (6.5MHz) and 5.74MHz (6.258MHz). These are connected to the FM demodulators via filters (pins 14, 15). The audio signals are conveyed to the stereo decoder part on the stereo decoder TDA9840T (see below).
For NICAM, a second IF (SSIF) is passed to the QNIC sub-printed board.
For the BG/DK stereo variant, the second audio IF is conveyed optionally to the audio filter pair 5.5/5.74 MHz or 6.5/6.25 MHz via a switchover IC [7708].

2.5.2 TDA 9814T

This IC is operated only in QSS. In addition to the TDA 9813, it also contains an AM demodulator for Secam L, L'. The second audio IF is passed via a switchover IC [7708] optionally to the audio filter pair for FM stereo 5.5/5.74 MHz or a 6.0 MHz filter for PAL 1 reception.

2.5.3 TDA 9812T

This IC is only used for a mono version for the PAL BG/I SEC L/L' variant and is a mono version of the TDA 9814 with identical pinning.

2.5.4 AGC

The two-stage AGC is the same for all ICs. For small signals, the control is only carried out in the IF-IC whilst the tuner operates with maximum amplification. From a certain input level (take over point) a control signal is issued for the tuner from the IF-IC. From this input voltage onwards, the control is basically only carried out by the tuner. The take-over point is set using potentiometer AGC-Adj. [3722] to the optimal sensitivity and input interference immunity. The IF-AGC voltage is supplied to the control-µP via transistor [7707]. This is used to determine the sequence of the programs to be stored in Autostore mode.

2.5.5 FM Stereo decoder TDA 9840T

For FM stereo, the signals L+R or 2R are transmitted by the sound carriers. To arrive at the L and R, a decoding circuit is required. This computing circuit is implemented in the TDA9840T. The input attenuators can be set with the IIC bus and are used to adjust the level and set the channel separation. The frequencies containing the stereo recognition or dual tone recognition are filtered out via an LC network. For dual audio or MONO, the aforementioned computing circuit is deactivated.
The de-emphasis is carried out internally by the capacitors [2775 and 2779].
For the variants with NICAM and FM stereo, the output signals for the NICAM part are passed to the output selection switch on the TDA9840T (pin 9,10) and the audio signal is selected in the TDA9840T (outputs pin 13,14) via the IIC bus using software.

3. FM Audio AF

3.1 General

All audio input and output selection switches, and the hi-fi FM audio signal processing, are located in the TDA9616 [7651]. This IC is controlled solely by the IIC bus. The carrier frequencies and bandpass filter for the FM audio part are adjusted by the TDA9616 independently. This adjustment is started via the IIC bus following a mains reset. The HP2 signal is used as a reference for this (pin 40).

3.2 Audio IO

The input and output selection switches are controlled by the IIC bus. Audio signals from the front end, both Scart sockets, the cinch sockets on the rear of the unit, the microphone amplifier and the front sockets, are passed via pins 1 to 10 or 44 to the two input selection switches which select the respective signals for the FM and the linear audio part. The output selection switches for Scart 1, connected in parallel to the cinch outputs; Scart 2 and the headphone output (pins 15, 16, 18, 19, 13, 14) independently select the respective signal sources.

The RFAGC limits the maximum amplitude of the signal to the modulator (AMCO) to prevent overmodulation.

The line TRIA _ ALM passes (controlled by the IIC) the size of the audio signals or the level of the playback envelope curve (during tracking) to the deck processor.

3.3 FM Audio

3.3.1 Recording:

The signal coming from the input selector switch (INPUT SEL) reaches, via a level actuator (VOLUME) and a deep pass filter (fg > 30 kHz), the NOISE REDUCTION block, which compresses the dynamics during recording. The compressed signal is passed to both FM modulators (1.4MHz and 1.8MHz carrier frequencies). Both carriers are added and reach the head amplifier via pin 36.
beiden Träger werden addiert und gelangen über Pin 36 zum Kopfverstärker.

3.3.2 Playback:

The signal from the head amplifier is passed to the HF-AGC via pin 37 where the tape and scanner tolerances are compensated. Via the two band pass filter and limiters, the FM signals reach the PLL demodulators. Head change-over interference is bypassed using SAMPLE & HOLD (triggered by the HP2 signal). The demodulated signals are then expanded in the NOISE REDUCTION part. The hi-fi signals are then available at the output selection switches. If no FM playback is present, the IC automatically switches the output selection switches to linear audio.

3.4 Interface to the linear audio

In recording mode, the input selection switch NORMAL SEL in the TDA9604 [7850] selects the audio source for the linear audio part in the signal electronics IC (LA72525) and passes this signal to pin 17 (AMLR).

In stereo sets, the input selection switch on the signal electronics IC LA71525 [7007] is always set to IN2 (pin 73).

During playback, the AMLP signal from the linear audio part in the signal electronics IC (pin 77) is carried via pin 19 from TDA9604 [7850] to the playback level attenuator (NlLevel),which can be adjusted in service mode using the IIC bus.

4. Audio linear (AL)

The signal input for recording to loop-through (EE) is pin 73 on LA71525 [7005]. During record and EE, the selected signal passes through the linear amplifier and then a mute stage and before leaving the IC on pin 77. This is output leading to the FM audio part. The attenuation chain on pin 77 sets the required level for the ALC (Automatic Level Control) detector, whose time constant is determined at pin 72, and the level for the recording amplifier. L5601, R3615 and C2610 form the pre-emphasis for the recording amplifier.

The output for the recording amplifier is pin 1. The recording current is then added to the bias current via resistor [3622] and flows via the head to pin 5, where the switch is closed. During playback, the switch at pin 7 is closed. The playback signal is amplified during the equalizer stage (time constant between pin 8 and pin 10. The resistor [3629] and the capacitor [2622] determine the head resonance during playback.

In longplay mode, the frequency characteristic is adjusted with RC networks [C2611, R36151 for record and with [C2612] for playback.

The erase oscillator supplies a signal with approx. 70 kHz for the audio erase head and the bias current. To avoid interference, the oscillator should be switched on and off slowly (switching stage T7604, time constant C2609, R3617, R3610).

The bias current is set using potentiometer [3626]. The maximum current for the oscillator circuit is limited to approx. 60mA using R3611 and the base current divider resistors on T7604.

5. Head amplifier (HA)

5.1 FM audio part

Head amplifier IC STV5712 [7104]

5.1.1 Recording

Pin10 SW REC switches to record. The inverter switch 7102 protects against deletion if the power supply is interrupted.
The recording current signal is supplied from the FM audio processor TDA9616 to input VIN pin 11.
Pin 15 IOUT acts as a current source for the recording current to the heads.

5.1.2 Playback

One low-noise playback amplifier for each head is switched into the signal path via the head selection switch SW_H pin 9. The FMAP output leads to the FM audio processor TDA9616.

5.2 Video part

Head amplifier IC STV5744 [7103] (4 heads), STV5742 [7108] (2 heads)

5.2.1 Recording

FMPV is the input for the switchover to REC using switch 7105. REC IN is an addition point for the recording current signals luminance, PAL chroma and SECAM chroma.
IOUT acts as a current source for the recording current to the heads.
The current through 3114 on TRIV acts as a current reference for setting the recording current. Pin 18 or 14 is also an input which is used to control the recording current.
7107 switches with 4 head devices and SP recording, a resistance parallel to 3114 and therefore allows the required increase in recording current for SP.
The Record AGC is only specified during CSYNC2 = H.

5.2.2 Playback

FMPV is the output for the playback signal to the video processor LA71527.
One low-noise playback amplifier for each head is switched into the signal path via the head selection switch SWIN.
The voltage at TRIV supplies a direct voltage proportional to the signal strength from FMPV, which can be evaluated for the automatic tracking.
For picture search, the SP and LP heads are changed over using the next rising edge in the CSYNC2, in other words, at the end of the line in the non-visible area.
ISWS short-circuits the unused head pair to the amplifier inputs, thereby correcting the crosstalk in the ring transformer in the scanner.
ENVC supplies the information as to whether or not the signal is greater than the SP or LP heads.

6. Video Signal Processing VS, SECAM L-chroma processing VS-SEC, chroma noise reduction CNR

6.1 Switchover functions in the signal electronics IC LA71527

The signal electronics IC LA71527 [7005] are controlled by the control-µP via the IIC bus on pins 63 and 64.

REC/PB
via the IIC bus
During RECORD pin 19 (REC HIGH OUT) goes to 5V

PAL/SECAM/MESECAM/NTSC
Via the IIC bus
During NTSC playback, pin 43 goes to 5V

SP/LP/SLP
Via the IIC bus

VIDEO ENTRY
At pin 33 (FFP), the artificial picture pulse for the playback features is entered:

Loop through	< 0.8V
Artificial picture pulse	> 3.7V

COLOR VECTOR
The color vector is adjusted using pin 67 (CSCP):

Normal	< 0.8V
LP features color = HSC signal	

6.2 Recording :

6.2.1 Luminance

The input signal (VBS) is available on the IC [7005] pin 35 as FBAS with 1Vss. In the IC [7005], the video signal first passes through an amplification control (time constant determined by C [2035]). Following the AGC, the signal reaches a terminal stage, is attenuated by 6 dB and goes via a 3.5 MHz deep pass filter to the chroma disconnection to the vertical emphasis (out: pin 42, in: pin 40). This emphasis comprises a 1 H-CCD delay line in the IC [7003] (in: pin 5, out: pin 7) and an emitter follower [7004]. The signal then travels via another emitter follower 7006 from pin 25 to pin 26. The filter does not function in REC mode on the basis of the emitter follower, due to the low resistance of the emitter follower. The Y signal then travels through the detail enhancer, the non-linear emphasis, the linear emphasis (time constant via pin 23,24) and the white/dark clipping stage.
The signal generated in this way then control the FM modulator directly. Before the FM signal leaves the IC [7005] at pin 18, it passes through a further low pass filter. Then it is passed to the chroma signal via an external emitter follower [7008) and RC cell as FMRV in the head amplifier addition point.

6.2.2 Chrominance PAL

The chroma signal is separated from the incoming video signal (pin 35) by a band pass filter (BPF1) and reaches an ACC stage. The ACC amplifier stage controls the chroma amplitude for the subsequent stages (time constant via capacitor [2057] on pin 13). The chroma signal is then conveyed to the main converter. The main converter mixes the 5.06MHz subcarrier on the auxiliary converter with the 4.43 MHz chroma signal to the 627kHz chroma FM signal.

The subcarrier is a mixture of 4.43MHz (the REC APC time constant on pin 54 compares quartz and burst frequency) and (40+ 1/8) fH = 627kHz (produced by 321fH -VCO, time constant pin 49/51 and phase rotation in accordance with the VHS standard, control pin 66). Via a band pass filter and the color killer stage, the converted chroma signal reaches pin 14 on the IC, where it is added directly to the Y FM signal via an adjustment controller [3118]. The color killer can either identify the incoming signal itself (PAL yes/no, PAL: chroma signal out, SECAM L: chroma signal killed) or can be set to PAL or SECAM L via the IIC bus. The quartz oscillation (pin 56) is used for chroma processing, in addition to the reference frequency, and also for generating the pulse frequency for the combined CCD [7003, pin 10] and for the chroma noise reduction-IC [7807, pin 10].

6.2.3 MESECAM

The signal path is virtually identical to the path for PAL.

The differences are:

- No phase rotation.
- The filter characteristic for the chroma band passes becomes wider.
- Free-running quartz frequency
- The control-µP generates the control signal for MESECAM via the IIC bus

6.2.4 SECAM L

The FBAS signal (VBS) from the in/out part reaches, via the emitter follower [7068] the bell filter (cloche), which returns the emitter-side HF pre-emphasis. In Secam L- IC pin 29 [7066], the signal goes through a 15dB amplifier and a frequency divider. This generates the 1.1 MHz signal required for the recording using frequency separation (1:4) on the chroma signal. This signal is then connected to pin 21, followed by a band pass filter. The band pass filter suppresses the harmonic waves which occur during the frequency separation. At the same time, the chroma signal is blanked at this point during the line synchronous pulse period. It then runs through a 10dB amplifier and is connected to pin 15 on an anti-cloche filter. This produces the FM pre-emphasis again, which is provided as standard for a Secam chroma signal. This is then added to the Y-FM signal via and adjustment controller [3076] as CSRV signal to the head amplifier addition point.

6.3 Playback:

6.3.1 Luminance

The FM playback signal goes from the head amplifier [7103/ 7108] to the signal electronics [7005], pin 15 as FMPV. In the IC [7005], the level of the envelope curve is first controlled and then filtered in FM processing. On pin 17, the signal exits the IC, runs through a phase shifter and a transistor stage to adjust the filter characteristics and re-enters the IC [7005] on pin 20. The FM signal limited using the double limiter is demodulated and filtered using a deep pass. The demodulated Y signal is also affected by the recording-side pre-emphasis. This now removes the linear de-emphasis at the base of the emitter follower [7006]. The filter circuit is effective, as pin 25 becomes an open collector output in playback mode, whose load impedance is determined by the de-emphasis circuit. Using a peaking stage, frequencies are raised by approx. 2 MHz (time constant pin 22).

The Y signal is then terminated, filtered by a low pass, and carried by a vertical noise canceller or dropout compensator. For this purpose, the Y signal leaves the IC [7005] (out: pin 42, in: pin 40) and is delayed by 1H in the IC [7003]. The CCD-1H delay line is effective for the Y signal first as a comb filter (vertical noise suppression) and secondly as a line storage device for the dropout compensation.

The subsequent switching stages are: The non-linear de-emphasis, horizontal noise canceller and the picture control switching to the increase in edge steepness (sharpness). The chroma signal is then added to the luminance signal and output as a FBAS signal (pin 38, VSB).

6.3.2 Chroma PAL

On pin 15, the FMPV signal is carried from the head amplifier to the IC [7005] signal electronics. From the FMPV signal the 627-kHz chroma signal is filtered using the internal low pass. The ACC amplifier amplifies and controls the chroma amplitude. To reduce the low frequency chroma flickering, an additional capacitor [2054,2056] is connected during playback for each video head. The switchover is carried out using the CROT control signal. During feature mode, no capacitors are connected (CAGC = High) to ensure fast chroma control.

In the main converter, the chroma signal is mixed with 5.06 MHz back to the original 4.43 MHz. The 5.06 MHz are produced in playback from the free-running quartz oscillator and from the (40+1/8) f_H = 627 kHz frequency derived from the 321f_H-VCO. After the main converter, the chroma signal is mostly freed of crosstalk from additional traces using 2H comb filter [7003]. The chroma signal is then filtered using a band pass, checked by the color killer, looped through via pins 46 and 45 (or passed through the chroma noise reduction IC [7807]) and then added to the Y-signal.

6.3.2.1 Chroma noise reduction

The amplitude and phase noise from the chroma signal is improved by the CNR-IC [7807]. The CNR-IC [7807] is a recursive comb filter comprising 2-line CCD and feedback loop. An accidental color shift is caused by the mean value generation across several lines. To prevent this color shift, the chroma noise reduction is switched off at vertical step changes (high on pin 17 [7807]). To detect vertical step changes, the Y signal (pin 42 [7005]) is compared to the Y-signal which is delayed by one line (pin 40 [7005]). The difference in levels is compensated using adjustment controller [3817]. The detection threshold is determined by the voltage fall at resistor [3806].

The chroma noise reduction only functions for PAL signals.

6.3.3 Chroma MESECAM DK

The signal path is virtually identical to the path for PAL.

The differences are:

- The 321 f_H VCO is synchronised by the Sync.
- No phase rotation.
- The comb filter is not active.
- Internal band pass filters have a larger bandwidth.
- The control-µP generates the control signal for SECAM B/G via the IIC bus

6.3.4 Chroma SECAM L

During playback, the FM signal from the band (FMPV) is carried to pin 23 [7066], amplified by 6dB, conveyed over the same band pass as for recording, and amplified again by 10dB. After pin 16, the NF pre-emphasis for recording is reversed. The anti-cloche switching in recording is used here as cloche switching.

In the following stages, the signal is adjusted (AGC) and the frequency of the signal is doubled. The band pass on pin 10 frees the signal from interfering harmonic waves, before the signal is doubled in frequency once more. So that the signal becomes a standard Secam chroma signal, it is provided with an HF pre-emphasis again (anti-cloche). Finally, the chroma signal runs through a color killer stage, a band pass filter and an emitter follower [7067], before it reaches pin 45 of the signal electronics 7005 IC as a CSP signal via a coupling capacitor.

6.3.5 NTSC

During the playback of NTSC signals, the original NTSC chroma is converted into a PAL chroma signal (see above for control signals). This requires an IC-internal switchover in the chroma part, but also a switchover in the CCD-IC [7003] to a 1H comb filter to the crosstalk reduction (PAL 2 lines). Line and picture frequencies remain unchanged in accordance with the NTSC standard.

6.3.6 PAL M,N

As for chroma PAL (7.3.2).

7. Input / Output (IO)

7.1 Video:

The entire video-I/O is carried out using the matrix switch STV6401 [7506], which is controlled by the controller via the IIC bus (SDA,SCL). To do this, the following signals are connected to STV6401 at the inputs: Front end video (VFV) pin 4, video in EI (VIN1) pin 6, video in E2 (VIN2) pin 8, video out (VOUT) pin 10 and front video (VFR) pin 12. The outputs OUT3/pin 15 and OUT2/pin 16 are fitted with a 6dB amplifier in the IC and convey the signal to the respective Scart socket. OUT1/pin2 has no amplifier; this signal (VBS) is passed on to the following parts of the circuit for further processing: VS, VS-Secam, VPO (VPS/PDC/OSD), Follow Me.

The VOUT signal is also passed to the modulator via emitter follower [7709].

7.2 Decoder operation (REC or E to E)

7.2.1 Program position with decoder (front end)

The front end signal (VFV or AFV1/2) is passed to the decoder connected to Scart 2 and from there, goes back to the VCR via VIN2 or AIN2L/AIN2R.

External input with decoder (7.2.2) is not possible for these program positions.

7.2.2 External input with decoder

The signal from Scart 1-In (normally TV set) is passed to the decoder connected to Scart 2. For scrambled programs, the decoder switches the pin 8 to high. The VCR then passes the decoded signal from Scart 2-In to Scart 1 Out.

8. Central control & deck electronics AI01, AI02, DE

8.2 SAA 1310 Interface drive electronics

8.2.1 CTL stage

The IC SAA 1310 contains a read/write stage for the CTL track with the option of overwriting an existing CTL track without any interference. The playback stage is fitted with a "digital" two-stage AGC. This logic circuit identifies the size of the output signal supplied by the CTL head, and then selects the best amplification ratio in the playback stage using comparators. The CTL head voltage can vary greatly due to the different tape speeds. The slowest tape speed is in LP mode. The highest speed is used during INDEX SEARCH. To ensure that the duty cycle in the tape sync is always reproduced correctly in the conditions mentioned above (important for detecting VISS marks), the amplifier must not be overdriven. The two-stage AGC alone cannot cover the large dynamic range of the input voltage. The amplifier is therefore also equipped with an internal low pass characteristic. Furthermore, the transistor [7442] is used to further reduce the amplification for all WIND modes. In this case, the signal IWIND ="L" and T7442 are blocked. If T7442 is blocked, the amplification is mainly determined by the internal negative feedback resistors on the SAA 1310, [7443] and the external resistor pos. 3373. The CTL head signal amplitude in SP is approx. 1 mV pp (typ.). The polarity of the playback amplifier can be switched over using line VISS (Video Index Search System). This is the only way it is possible for the µP to write a VISS mark onto the tape without spikes. The Write/Read (W/R) signal is used to switch over between record and playback: W ="H", R ="L".

8.2.2 POR (Power On Reset) - generator

The POR generator contained in the SAA1310 [7443] only requires one external capacitor [2476], which specifies the length of the POR pulse. For 33 nF, tPOR is approx. 30msecs. The response threshold of the reset circuit lies between 4.5 and 4.8 V. Supply fluctuations which are shorter than tPOR/100 area and which do not fall below 3.5 V, do not trigger the POR. The operation-µP and the control-µP are reset using the inverted POR.
There is an additional line which runs from the control-µP to the operation-µP (IDC-RESET) which can reset the operation-µP.

8.2.3 The sensor interface

The four comparators in the SAA1310 [7443] are used to convert sensor signals to the logic level. Two of these comparators have open collector outputs (pins 11 and 13), which can switch a current of 100 mA. The outputs are overload protected by a current limiter and thermal shutdown. Only the non-inverting input on each comparator is accessible from the outside. The other inputs are connected to an internal reference of nom. 2.5V. The fixed hysteresis of the comparators of approx. 10 mV is also located internally. The sender diodes on FTA and WTR are supplied with a pull-up.

The comparators are connected as follows:

Comparator 1:
In = FTA, pin 5; Out = FTAD, pin 15:
FTA = threading tachometer. This signal comes from a forked light barrier in the deck. An infra-red light beam is interrupted by a 4-blade impeller (butterfly). For a correct evaluation, the output amplitude of the photoelectric barrier must fluctuate at least between the voltage levels 1.5 V and 3.5 V. An additional hysteresis is created with a resistor.

Comparator 2:
In = WTR, pin 6; Out = WTRD, pin 14:
WTR = Winding tachometer right, from a reflection photoelectric barrier. The level is the same as for the FTA.

Comparator 3:
In = WTL, pin 7; Out = WTLD, pin 13:
WTL = Winding tachometer left, from a reflection photoelectric barrier.
The level is the same as for the FTA.

Comparator 4:
In = FG, pin 8; Out = FGD, pin 11:
FG = capstan tachometer. This signal stems from an amplifier for the tachometer hall sensor on the motor unit. The output impedance is 10 kOhm. The amplitude of the near sinusoidal signal is normally 1 Vpp . It should not fall below 300 mV PP. It is AC-coupled via a capacitor [2490]. In order for a bias current to flow, the input pin 8 must be passed via a resistor [3378] to the reference voltage on pin 3. A capacitor [2474] for filtering out high-frequency interference is arranged in parallel to the bias resistor.

8.3 Interface to head drum motor driver

The head drum control voltage (speed and phase control information) is output via a µP-output (7406/pin 87; PWM 14-bit). This pulse-wide modulated signal is fed to the head drum motor driver IC TDA5241 (7446/pin 13) and integrated with the capacitor [2492]. This IC already has a completely integrated 'start-up' circuit fitted. For the commutation, the head drum motor driver uses the electromagnetic energy (EMF) on the non-current carrying motor coil (transformer principle). The motor speed is also discharged from there at the same time. The phase of the head disc is discharged from a position coil. Speed and phase are multiplexed into one signal (PG_FG, 7446/ pin 6). During this process the falling edge of the signal is the speed (FG/ 450Hz) and at 25Hz the position pulse (PG) has a positive edge.

The connection from the HMO driver TDA5241 [7446] on the motherboard to the head drum motor is made using plug connector 1948.

The current input from the +14VM1 is normally 70mA at room temperature. During acceleration of the motor, approx. 0.5A may flow for a short period.

8.4 Interface to the capstan motor

The driver IC on the capstan motor is activated via connector 1946.

CAP is the signal for the capstan speed. This voltage may vary without load between 0 and 5 V. The rotational direction of the motor is determined using CREV (capstan reverse). The maximum current input for the motor is limited to 1A. Typical values in PLAY mode are 0.2 ... 0.3 A.

8.5 Loading motor driver

The TMO driver uses a bridged dual power op-amp L2722. The element can supply +/-1 A output current. It contains short-circuit and thermal overload protection and integrated flyback diodes on the outputs. The output current is limited to approx. 0.7A by the internal resistance of the loading motor (18 Ohm typ.) (start-up or motor is blocked). Between the IC outputs (pins 1 and 3), a "Boucherot" circuit (1 Ohm, 100 nF) suppresses a spurious 3MHz oscillation from the output stage. One half of the bridge is controlled via the TMO line and acts as a comparator. The other half is an amplifier integrator with a 3.9 gain. A change in the input voltage (THIO) of between 0 and 5V results in a change in the output voltage of between 0V and almost Ub. With 50% modulation (THIO = 2.5 V) pin 3 has approx. 7 V. The capacitor in the negative feedback of the op-amp filters out the PWM frequency of approx. 39kHz. During POR, the µP issues "L" to the THIO line, whilst TMO is "H". In order to ensure that no current flows in the motor during the POR pulse, the aforementioned polarity must be maintained. This prevents the motor being destroyed in case of prolonged running or blockage. This circuit, however, also has the disadvantage that if the 5 V supply fails (e.g. because the 5V fuse has blown), residual voltages may be passed to the IC inputs via the adjacent 14 V voltages. These residual voltages trigger the comparator and the op-amp is opposite ways, causing a short-circuit in the blocked loading motor after one minute. In order to avoid this, a separate voltage divider [3385,3382] is used for the comparator. Both output on the L2722 [7440] are then in "common mode" if this error occurs.

8.6 Analog interface to the µC

The following analog levels are supplied to the µC's internal A/D converter:

TRIV	Tracking Information Video
TAE/TAS	Tape End / Tape Start Detection
INIT	INITialisation (drive switch)
RECP	RECord Protection (drive switch)
AGC	Automatic Gain Control (front end)
TRIA_ALM	Tracking information audio/ audio level information

8.7 Tape end - LED control

The LED current is switched using transistor at pos. 7407. The ON time is approx. 1 msec with an ON/OFF ratio of 0.09.
The LED current is normally 180 mA. In order to prevent interference from the relatively high pulsed current 'spreading' through the entire unit, the LED is fed from the 14VM1, and filtered by 2 NFRs (Non Flammable Resistor) [3426,3431] with 10 Ohm each and a 220µF electrolytic capacitor [2406].

8.11 EE-PROM

The R/W cycle is carried out via the fast IIC bus SDA3, SCL3. In the EEPROM, parameters specific to the device or the deck are stored, together with the preset stations and some options.

The head changeover position is adjusted automatically with a test cassette in the service test programme.

8.12 CMT detection (video detection)

This has been extended due to identification problems with weak transmission signals and video signals not conforming to the STANDARD (common channel interference). The CSYNC line is supplied to the µP on pin 33. A hardware integration of the picture pulse compensates the interference generated by the common channels and weak signals.

8.13 Micro-controller (TMP93C071 F)

The micro-controller (7406) is a high-speed 16-bit micro-controller (ROMless) combines the following functions:

- external ROM range of 16Mbyte, addressable
- 8 Kbytes internal RAM
- 8-bit A/D converter (16 channels)
- serial bus interface: - 2 serial, 2 IIC bus, 1 UART (RXD/TXD) PWM outputs: - 3 x 14bit, 9 x 8bit
- composite sync input - special servo inputs

The component is used in QFP (120 pin).

There are 16 analog inputs available. The resolution of the A/D converter is 8 bit. The maximum input voltage range which can be processed is 0 ... 5V (determined by the reference voltages ADREF pin12 and ADGND pin13).

12 analog/PWM outputs - 3 with 14-bits and 9 with 8 bit resolution, are available. The outputs supply a signal with a constant frequency (approx. 39kHz) and a variable duty cycle.

8.14 External RAM CY62256 (7452)

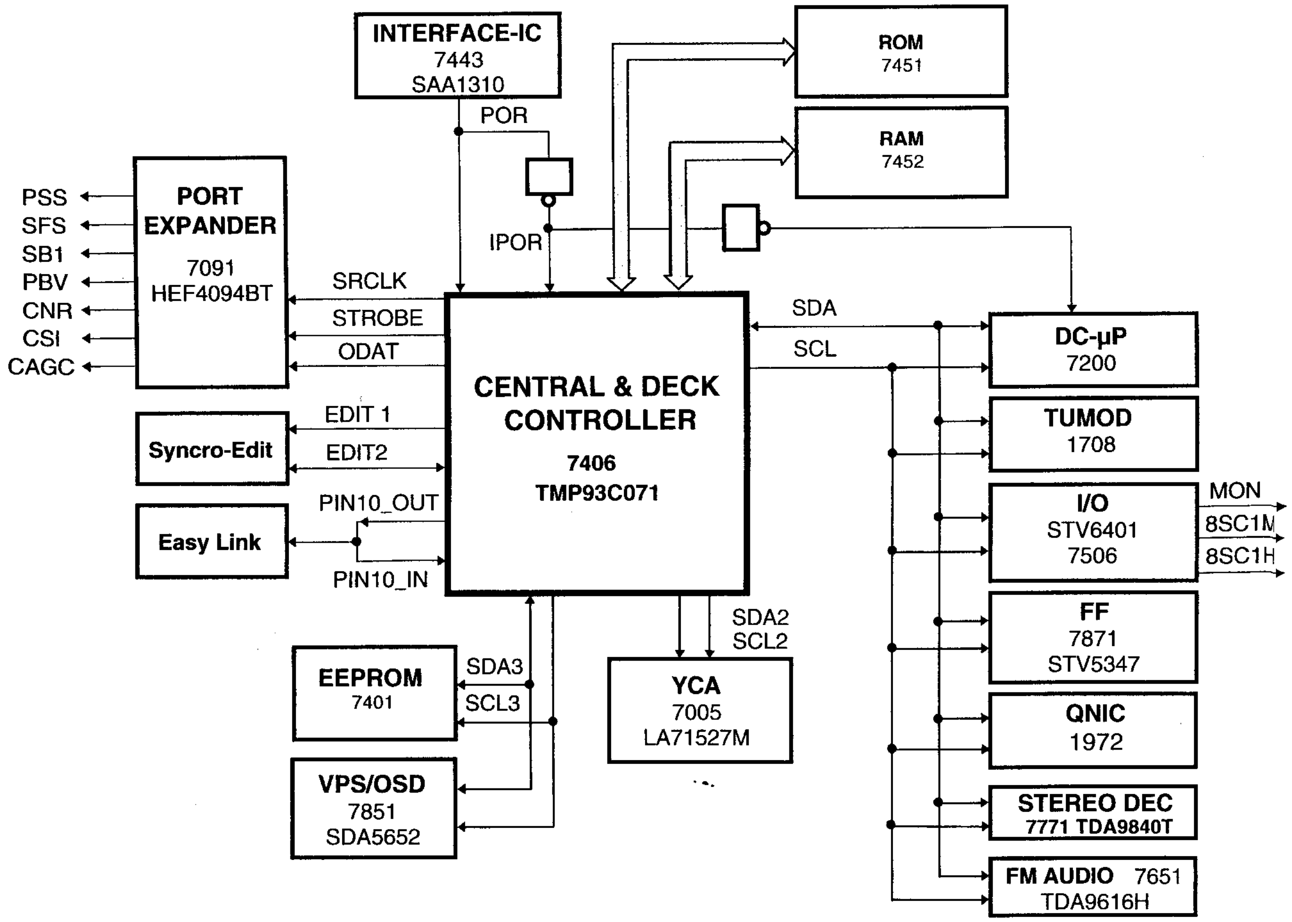
Currently, an external RAM of 256kBit (22k x 8bit) in size is being used.

8.15 External ROM M27C4001 (7451)

Current external ROM of 4Mbit (512k x 8bit) requires a specified access time of ≤ 100ns.

8.16 Port expander PE

The shift register [7091], is controlled by the control-µP via the lines SRCLK, ODAT and STROBE, and is used as the port expansion for the microprocessor.


INTERFACE-IC
7443
SAA1310
POR
IPOR
ROM
7451
RAM
7452
PSS
SFS
SB1
PBV
CNR
CSI
CAGC
PORT EXPANDER
7091
HEF4094BT
SRCLK
STROBE
ODAT
CENTRAL & DECK CONTROLLER
7406
TMP93C071
SDA
SCL
DC-µP
7200
TUMOD
1708
I/O
STV6401
7506
MON
8SC1M
8SC1H
FF
7871
STV5347
QNIC
1972
STEREO DEC
7771 TDA9840T
FM AUDIO 7651
TDA9616H
Syncro-Edit
EDIT 1
EDIT2
Easy Link
PIN10_OUT
PIN10_IN
EEPROM
7401
SDA3
SCL3
VPS/OSD
7851
SDA5652
SDA2
SCL2
YCA
7005
LA71527M

8.17 Easy Link (P50)

For the communication between the TV set, video recorder and the peripheral devices, a bi-directional single-wire bus is used, which runs via pin 10 to Scart socket 1. In connection with the Scart connection on pin 8, various video recorder functions activate actions on the TV and vice versa.

9. Follow Me part (FOME)

The video signal from the internal front end of the VCR (VFV) and the VBS signal, which, when compared, corresponds to the TV front end video signal connected to Scart 1-Input (VIN1; i.e. the input selection switch in the I/0 on In2 pin 6/VIN1), are „digitised“ via comparators and are then compared. Low at the output of the circuit (FOME signal - 0.8V) shows that the picture contents of both video signals are identical and that both receiver parts (TV & VCR) must be tuned to the same station (possible errors in detection may occur with similar signals, e.g. news programmes).

10. VPS/PDC, on-screen display VPO

10.1 General

The combo-IC SDA5652 [7851] contains both a data slicer for VPS/ PDC decoding and the entire on-screen display function. The IC is controlled via the fast IIC bus (approx. 330kHz/ SCL3 or SDA3). As, during the current production runs, the IC is being changed to a type with integrated H-PLL, it is possible to differentiate both variants using a readable register (version no.: processed in the software).

10.2 PDC/VPS

The VPS/PDC decoder part on the SDA5652 [7851] reads from the vertical blanking gaps and the VPS and the PDC data and stores this information in the IC's internal RAM (read out by the controller via the IIC bus). The time can also be read from the TXT header line (required for "Time download"). The date is not called up from the TXT header, but only via PDC format-1 (various write versions of the preset stations).

As the input signal for the data extraction, the video signal from input selection switch (VBS) is connected from the I/0 to pin 17 on the IC via a coupling capacitor.

The following modes (data formats) are identified:

- VPS (Timer data and sender name)
- PDC Format 2 (Timer data and station name)
- PDC Format-1 (station name and date and possibly time)
- TXT header line (time for 'Time Download')

10.3 OSD part

The VPO-IC SDA5652 facilitates both the generation of the keyboard matrix into a video signal and the generation of an entire picture (full page) for menu-control or if no background video is available.

The video signal VSB passes from the signal electronics to the input on the OSD-IC (pin 18). From output (pin 15), the signal is conveyed via emitter follower [7854, 7855] and the low pass filter in-between [5854, 2864, 2865] as VOUT signal to the I/0 or modulator. The low pass has a limit frequency of approx. 8MHz and is used to suppress harmonics which are produced by the OSD part (bandwidth limit for the video signal).

As the system clock frequency, the doubled color subcarrier oscillation from the signal electronics is used (2FSC/8.86 MHz) which is connected via a selective emitter follower [7002] at pin 3 on the IC. For the vertical synchronisation of the keyboard matrix, an OSD frame pulse (OFP) is generated by the controller and passed to the IC on pin 9. The horizontal arrangement is made on pin 7 on the IC via an H-sync which is separated out from the video signal. In the case of the keyboard matrix in Secam signal, a bypass is activated between video-in and video-out via a switch inside the IC and a series resonant circuit [5852, 2857].

So that the keyboard matrix remain stable and readable with slightly distorted video signals (noise, common channel, trick play mode ..), an H-PLL is required for the horizontal synchronisation. As the internal H-PLL has not functioned perfectly in the first OSD-IC version, the H-sync required is generated from the VSB signal using the PLL-module BA7046F [7857]. The free-running frequency in the H-PLL is determined by resistor [3884] (130 kOhm/±2%) and is approx. 15kHz. This H-sync is available on pin 2 on the PLL-IC, and is connected directly to pin 7 on the OSD-IC. The VSB signal is attenuated by 6dB using an emitter follower or limited to a band of approx. 500kHz [7856, 3881, 3882, 2868] and connected to a coupling capacitor [2869] on pin 6.
With the improved/second OSD-IC version (transfer is currently in production), the horizontal sync pulse is generated by the IC itself via an internal sync-separator and then a connected internal H-PLL from the signal (VBS) connected to pin 17. When using this OSD-IC type, the external PLL (BA7046F [7857]) including peripheral circuits is no longer required.

During full-page OSD (menu, no video signal, ...) neither a vertical-sync (OFP) nor an H-sync is required, as in this mode, the OSD-IC generates everything from the system clock frequency, i.e. from the 2FSC signal.

11. NICAM decoder SAA 7283/84ZP - QNIC

The IC SAA7284 is an NICAM decoder which does not require any adjustment. It is arranged on the sub-printed board QNIC. The NICAM signal is filtered out by internal filters and is converted into the basic band. The signal is then demodulated and decoded. The digitised audio signal is converted into an analog signal via a D/A converter. In addition to the NICAM decoding, an audio switch is available (inputs pin 7, 16) via which the internally demodulated or external audio signals can be selected.

This switch is used to switch over to the FM audio or AM sound with SECAM L/L' in case of incorrect NICAM decoding or a NICAM carrier not being available.

Two low passes with an amplification of approx. 6dB are connected to the output which remove the residual carriers from the audio signal.

12. Operating unit DC

The front controller [7200] is the core element of the operating unit, fulfilling the following tasks with the respective functional groups:

- shuttle evaluation
- evaluation of the keyboard matrix
- decoding the remote control commands from the infra-red receiver pos. 7220
- quartz clock
- integrated RAM to store timer data
- activation of the display
- 12C bus interface (SDA pin 20, SCL pin 21) to the motherboard

In case of a power failure, the back-up cell on pin 33 supplies the clock and the RAM corresponding to the value of 2200 (220mF gold capacity ... 7 hours). A diode [6200] prevents the back-up cell from discharging. During this time, pin 2 is at LOW level, so that further functions on the IC are switched off using the system quartz [1261] at pin 13 / 14.

12.1 Shuttle:

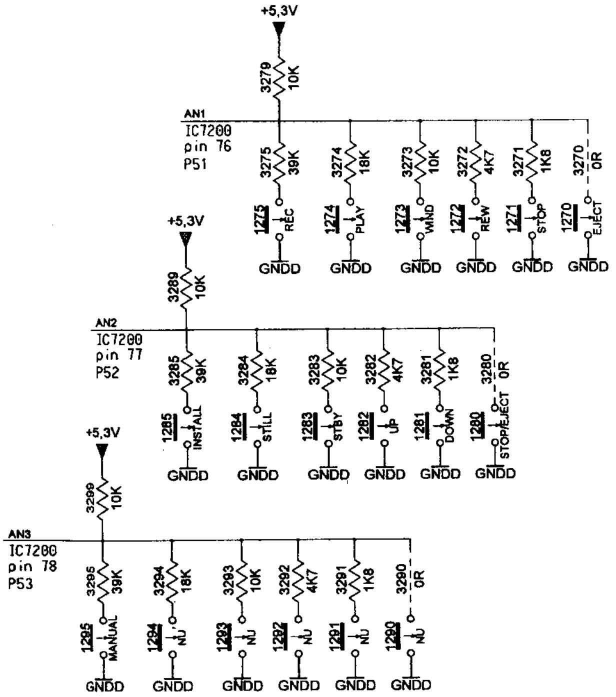
The shuttle EVQ WMH001 represents a binary coded rotary switch with a rotation angle of +/- 70 degrees and 16 switch positions. A spring returns it to the centre position once released. From this position, it can be moved in both directions by 7 or 8 switch positions. All switching conditions are realised using the various electrical connections for the four different shuttle outputs B1 - B4 with a voltage of 5VD (level lift 0V/5V). These shuttle signals are read and evaluated on the input ports P40, P41, P42, P43 on the front controller.

12.2 Evaluation of the keyboard matrix:

There are 18 different keys which are decoded by 3 ports (P51, P52, P53) via 6 assigned DC values each. Pressing keys simultaneously may lead to undesired functions.

Critical functions such as RECORD and INSTALL cannot be activated accidentally by pressing more than one key at the same time.

Schematic:



12.3 IR receiver and signal evaluation

The IR receiver [7220], which is only operational if the voltage 5VD is present, contains a selectively controlled amplifier and a photo-diode. The photo-diode changes the received transmission (approx. 940nm) in electrical pulses, which are then amplified and demodulated. On the output of the IR receiver [7220], a pulse sequence (level lift 0V/5V), which corresponds to the envelope curve of the received IR remote control command, can be measured. This pulse sequence is read into the front controller via the interrupt input P30/INT3 for further signal evaluation.

12.4 Generating the clock pulse

In the operating modes NORMAL, LOW POWER, STANDBY and MAINS OFF, the front controller and the sub-oscillator [1262] generate the clock pulse as the basis for the internal clock and date function. At port P22/XTOUT, a sinusoidal oscillation of 32.768kHz, with a level of approx. >3 Vpp can be measured with a 10:1 probe.

With the back-up capacitor [2200] fully charged, the back-up time is 7 hours.

12.5 Activation and function of the VFD display

In principle, the VFD display [7202] is a tube triode in which the heating filaments in the tube serve as cathodes (F1,F2). The activation of the 9 VFD grid (G1 - G9) is carried out via P67 - P77 on the front controller, and that of the 18 anodes (P1 - P18) via ports P80 - P87 and P90 - P97 on the front controller, each with a positive potential compared to the cathode. The anode P17 and P18 are activated statically from port 06 (pin 31) and port 07 (pin 32) via transistors 7242 and 7243.

The grids and anodes (digits and symbols to be displayed) are activated in the time-multiplex procedure (duty 1:10, scanning period 2.11 ms (9 x 235 µs), voltage lift 5V/-28V). A dimmer function is realised using pulse-width modulation of the grid-activation signals. At maximum display brightness, the pulse-width for each grid is 214 µs. With the help of software, this can be reduced in several stages to approx. 30 µs, which visually reduces the brightness of the VFD display accordingly.

A digit or symbol is only illuminated if the corresponding anode and the surrounding grid are switched simultaneously to 5V for a certain time within a scanning period. The electrons emitted from the cathode are accelerated by the positively charged grid and hit the luminous layer of the anode which is also positively charged.

During the remainder of the scanning period, the corresponding grid and parts of the anode are at -28V, due to the internal pull-down resistors in the front controller. This potential is still lower than the average cathode potential of approx. -16V, prevents the acceleration of electrons, thus causing the relevant grid and anode segments to go dark.

The heating voltage for the display is derived from the 14VDC voltage in the power supply. An AC voltage is generated via a chopper on the motherboard. This is passed via lines HEHI and HELO, on to the limit resistors [3257,3258, 3259) and the interference suppression coil [5001] at pins F1 and F2 in the VFD display. The Z -diode [6250] terminates the heating voltage via a resistor [3250] to approx. -16V. Measure directly between the pins F1 and F2, the heating voltage is normally +3.5Veff.

12.6 Headphone amplifier (ACP3)

The IC TDA7053A is used as the headphone amplifier. However, the bridge amplifier function on this IC is not used. The output voltage on the IC is limited to around 100mA per channel.

The volume is set using a PWM output on the microprocessor. The PWM signal, filtered via the filter switch, is present as a DC voltage on pins 2 and 8, whereby voltages under 0.3V switch the headphone output to mute. The maximum volume is reached at around 1.2V.

12.7 Microphone amplifier

A two-stage transistor switch forms the microphone amplifier. The amplification for the first stage is around 35dB (at a source resistance of 600Ohm). The second stage amplifies by around 27dB.

PRINTED CIRCUIT BOARDS

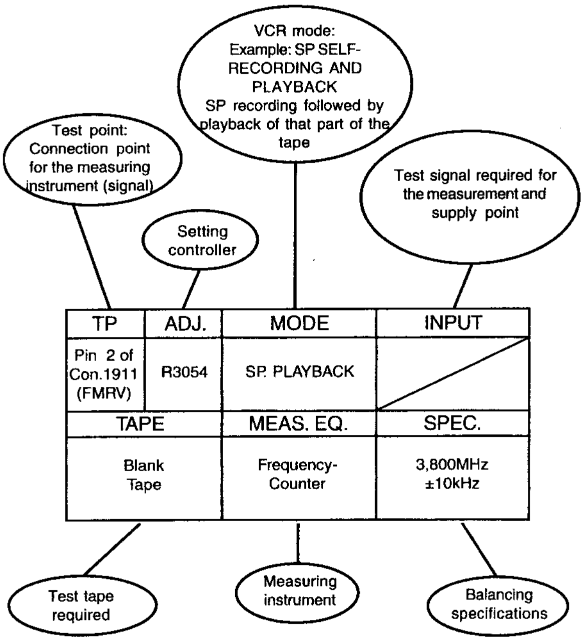
Instructions for electrical balancing

Measuring instruments

1. Dual trace oscilloscope
   - Voltage range :0.001 ~ 50 V/div
   - Frequency :DC ~ 50 MHz
   - Probe :10:1, 1:1
2. Digital voltmeter (DVM)
3. AF millivoltmeter
4. Frequency meter
5. Sine-wave generator
   - Sine-wave : 0 ~ 50 MHz
6. Test pattern generator with stereo modulation
7. VHS alignment tape 4822 397 30103

SPC alignment tape 4822 397 30268

Key to the balancing guidelines:


VCR mode:
Example: SP SELF-RECORDING AND PLAYBACK
SP recording followed by playback of that part of the tape
Test point: Connection point for the measuring instrument (signal)
Setting controller
Test signal required for the measurement and supply point
TP
ADJ.
MODE
INPUT
Pin 2 of Con.1911 (FMRV)
R3054
SP. PLAYBACK
TAPE
MEAS. EQ.
SPEC.
Blank Tape
Frequency-Counter
3,800MHz ±10kHz
Test tape required
Measuring instrument
Balancing specifications

⊤ ... antenna input

AV ... Euro AV-socket (Scart)

1. Power supply ASM (PS)

1.1 Setting the output voltage +5A (3179):

Purpose: Set supply voltage to the correct value.

Indications of incorrect setting:
The VCR functions will not work correctly.

TP	ADJ.	MODE	INPUT
1115/3,4	R3179	Playback	
TAPE		MEAS. EQ.	SPEC.
Any tape		DC Voltmeter	5.35V ± 0.05V

2. Front end (FE)

Servicing work after replacement:

– on the IC 7705: 2.1, 2.2, 2.3, 3.1, 3.2
– on the tuner/modulator: 2.2

2.1 AFC adjustment for PAL (5702)

Purpose: Correct setting for the demodulator AFC circuit

Indications of incorrect setting:
Poor or distorted reception from TV stations.

TP	ADJ.	MODE	INPUT
7705/20	5702	E to E	38.9MHz, 240mV$_{pp}$ at 7702/17; no antenna input
TAPE		MEAS. EQ.	SPEC.
		DC Voltmeter, Frequ. Generator	2.5V ± 0.2V

2.2 Setting the HF-AGC (3722)

Purpose: To set the "take-over point" on the Hf-AGC

Indications of incorrect setting:
AGC does not synchronise correctly if the input level is too weak. If the level is too high, the picture may be distorted.

The following preparations should be carried out before the setting:

– the device should be at operating temperature

TP	ADJ.	MODE	INPUT
TUMOD Pin 17	AGC-ADJ R3722	E to E	⊤ 5mV (74dB$_{\mu V}$) PAL white picture, CH27 (519.25), audio IF on, no audio modulation
TAPE		MEAS. EQ.	SPEC.
		Oscilloscope (10:1 probe) Video Pattern Generator	550mV$_{pp}$ ± 50mV

2.3 AFC adjustment for SECAM Band I (3702)

Purpose: Correct setting of the demodulator AFC circuit

Indications of incorrect setting:
Poor or distorted reception of TV stations.

TP	ADJ.	MODE	INPUT
7705/20	3702	E to E, SECAM L' tuned on preset!	33.9MHz, 240mV$_{pp}$ at 7702/17; no antenna input
TAPE		MEAS. EQ.	SPEC.
		DC Voltmeter, Frequ. Generator	2.5V ± 0.2V

2.4 40.4 MHz suppression (5704)

Purpose: Suppression of residual band I carriers.

Indications of incorrect setting:
Poor picture quality if the filter is suppressing the picture carrier.

TP	ADJ.	MODE	INPUT
1702/1	L5704	E to E	40.4MHz, 240mV$_{pp}$ at Tuner pin 17; no antenna input
TAPE		MEAS. EQ.	SPEC.
		Oscilloscope, Sinus Generator, Counter	minimum

3. Stereo decoder (FM_STEREO)

3.1 Setting the level for the stereo decoder

Servicing work after replacement:
– on IC 7771, 7705: 3.1, 3.2

Purpose: Control the amplification on stereo decoder 7771

Indications of incorrect setting:
Increased noise or overriding of the sound

The following preparations should be carried out before the setting:
– Call up the Service Test program (hold down the "STOP" button on the remote control and the "PLAY" button on the device at the same time for 5s.)

TP	ADJ.	MODE	INPUT
Scart Audio Output (Pin 1)	UP/ DOWN	Service Mode, Step 60	┐┌ Test picture, **Dual Mode** 1kHz, ±27kHz deviation, only on Language II
TAPE		MEAS. EQ.	SPEC.
		AC Millivoltmeter Video Pattern Generator	500mV$_{rms}$ ± 50mV, refer to description below

- Connect the millivoltmeter to Scart 1, pin 1
- Set the amplitude to the required value by pressing the UP (+) or DOWN (-) buttons
- After exiting using SELECT, the value will be stored in the EEPROM.

3.2 Channel separation in the stereo decoder

Purpose: Prevent crosstalk in the sound channels

Indications of incorrect setting:
Crosstalk in the sound channels

The following preparations should be carried out before the setting:

- Call up the Service Test program (hold down the "STOP" button on the remote control and the "PLAY" button on the device at the same time for 5s.)

TP	ADJ.	MODE	INPUT
Scart Audio Output (Pin 3)	UP/ DOWN	Service Mode, Step 61	┐┌ Test picture, 1kHz sound **only** on **right** channel (Stereo Mode)
TAPE		MEAS. EQ.	SPEC.
		AC Millivoltmeter Video Pattern Generator	minimum value, refer to description below

- Connect the millivoltmeter to Scart 1, pin 3
- Set the noise amplitude to the smallest value by pressing the UP (+) or DOWN (-) buttons
- After exiting using SELECT, the value will be stored in the EEPROM.

4. Erase oscillator (ER)

4.1 Erase frequency for the main erase oscillator (5641)

Purpose: Set the correct erase frequency for recording

Indications of incorrect setting:
Erase frequency (or harmonics from it) produces interference in the audible range

TP	ADJ.	MODE	INPUT
1964/1	5641	Record	
TAPE		MEAS. EQ.	SPEC.
Any Tape		Frequency Counter	70kHz ± 10kHz

5. Audio linear (AL)

Servicing work after replacement:
– on IC 7005: 5.1
– on the combo-head: 5.1, 5.2, 5.3

5.1 Audio linear playback level

Purpose: Set the playback level in the audio linear part

Indications of incorrect setting:
The playback is too quiet or overridden

The following preparations should be carried out before the setting

- Apply a sine-wave of 1kHz; 500 mVeff to Scart 1 (pins 2 and 6)
- SP Record from Scart 1
- Call up the Service Test program
- Play back the recording
- Call up step 62; after calling this up, the linear sound will be present on the output

TP	ADJ.	MODE	INPUT
AV1 (Pin 1 or 3)	UP/ DOWN	Service Mode, Step 62	500mV$_{rms}$ 1kHz
TAPE		MEAS. EQ.	SPEC.
Any Tape		AC Millivoltmeter, Frequency Generator	500mV$_{rms}$ ± 50mV refer to description below

Set the level to the required value using UP / DOWN.
The values set are stored in the EEPROM.

5.2 Erase frequency in the audio erase oscillator (5602)

Purpose: Set the correct erase frequency for 5.2

Indications of incorrect setting:
Erase frequency (or harmonics from it) produces interference in the audible range

TP	ADJ.	MODE	INPUT
9603	5602	Record	
TAPE		MEAS. EQ.	SPEC.
Any Tape		Frequency Counter	70kHz ± 10kHz

5.3 Magnetic biasing current (BIAS, 3626)

Purpose: Set optimal magnetic biasing current.

Indications of incorrect setting:
If the level is too high, the frequency response becomes poor. If the level is too low, the harmonic distortion is increased.

TP	ADJ.	MODE	INPUT
3626, BIAS1/2 (differential measurement)	BIAS R3626	Record	ᒣᒥ White picture
TAPE		MEAS. EQ.	SPEC.
Any Tape		Millivoltmeter Video Pattern Generator	7mV$_{rms}$ ± 3mV$_{rms}$

Checking the 'Bias' setting:

After the 'Bias' has been set to the specified value, record some music, play it back, and move the audio switch to the 'MONO' position.
Use cassettes from well-known manufacturers, but not chrome dioxide tapes.
Check that the treble is played back sufficiently well, and that the tone is not distorted. If there is too much treble, the 'Bias' current should be reduced slightly. If the distortion is too great, the 'Bias' current should be increased.

6. FM audio (AF)

Servicing work after replacement:
– on IC 7651: 6.1

6.1 Bargraph level

Purpose: Correct bargraph level displayed for the audio control

Indications of incorrect setting:
Bargraph level is displayed incorrectly depending on the device tolerances.

TP	ADJ.	MODE	INPUT
		Service Mode	AV1 Pin 2 & 6 500mV$_{rms}$, 1kHz
TAPE		MEAS. EQ.	SPEC.
		AC Millivoltmeter, Frequency Generator	Call up Step 63

After calling up step 63, the adjustment is made automatically.
If the adjustment has been carried out successfully, "OK" will appear on the display.
If one of the audio levels measured by the microprocessor is outside the permissible limits, "ERR" will appear.

The values set are stored in the EEPROM.

7. Head amplifier (HA)

Servicing work after replacement:
– on IC 7005 (VS): 7.1

7.1 Setting the PAL chroma write current (3118):

Purpose: Set the optimal chrominance level for recording

Indications of incorrect setting:
If the level is too high, the picture may be distorted.
If the level is too low, the colour may be too weak.

The following preparations should be carried out before the setting:

- Remove the drive
- Connect the emitter and the collector on 7008

TP	ADJ.	MODE	INPUT
R3118 (slider)	R3118	Step 10 of Service Mode; Record	ᒣᒥ Red Picture PAL 75% Saturation
TAPE		MEAS. EQ.	SPEC.
		Oscilloscope Video Pattern Generator	420mV$_{pp}$ ± 40 mV$_{pp}$

Disconnect the emitter and collector on 7008.

8. SECAM L chroma processing (VS_SEC)

Servicing work after replacement:

- on IC7066: 8.1

8.1 SECAM chroma write current (3076):

Purpose: Set the optimal chrominance level for recording

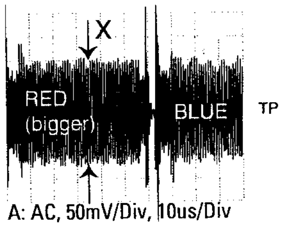
Indications of incorrect setting:
If the level is too high, the picture may be distorted.
If the level is too low, the colour may be too weak.

The following preparations should be carried out before the setting:

- Remove the drive
- Connect the emitter and the collector on 7008

TP	ADJ.	MODE	INPUT
R3076 (slider)	R3076	Step 10 of Service Mode; Record	¬r Red Picture SECAM 75% Saturation
TAPE		MEAS. EQ.	SPEC.
		Oscilloscope Video Pattern Generator	$210mV_{pp}$ ± $30 mV_{pp}$

Disconnect the emitter and collector on 7008.



9. Video signal processing (VS)

Servicing work after replacement:
- on IC 7103 (HA), the head disc, the motherboard: 9.1
- on IC 7003, 7005: 10.1

9.1 Studio picture control SPC

Purpose: Set the reference level for the SPC

Indications of incorrect setting:
"Strays" may occur or the picture may be played back with a lower resolution than might be possible

TP	ADJ.	MODE	INPUT
		Service Mode	¬r or AV1 black picture, no BURST
TAPE		MEAS. EQ.	SPEC.
SPC Alignment Tape		Video Pattern Generator	Call up Step 52 of Service Mode

The automatic adjustment procedure is started by activating step 52.
If the adjustment has been carried out successfully, "OK" will appear on the display. If the adjustment was incorrect, "ERR" will be displayed.
The values set are stored in the EEPROM.

10. Chroma noise reduction (CNR)

Servicing work after replacement:
- on IC 7003, 7005, 7801, 7804: 10.1

10.1 Amplifying the non-correlation detector (3817)

Purpose: Set the amplification of the 'non-correlation detector'

Indications of incorrect setting:
Poor chroma performance during playback

TP	ADJ.	MODE	INPUT
Collector 7801, 7804	3817	Playback	
TAPE		MEAS. EQ.	SPEC.
Prerecorded Tape		Oscilloscope	adjust to same level

11. Deck electronics (DE)

Servicing work after replacement:
- on the motherboard, the head disc: 11.1, Electro-mechanical adjustments in chapter 4

11.1 Vertical head change-over position

Purpose: Specify the head change-over position during playback.

Indications of incorrect setting:
Errors in head change-over and/or vertical picture flickering.

The following preparations should be carried out before the setting:

- Insert a test cassette with a standard video signal (e.g. 4822 397 30103)
- Call up the Service Test program

TP	ADJ.	MODE	INPUT
		Service Mode	
TAPE		MEAS. EQ.	SPEC.
VHS Alignment Tape			Call up Step 51 of Service Mode

After the adjustment has been made, the device switches to "STOP" mode and displays "OK".

If the adjustment has not been made correctly, the device displays "ERR".
This may be caused by the following:
There is an error in the standard video signal, the scanner is defective or the microprocessor is defective

The values set are stored in the EEPROM.

12. Display control (DC)

Servicing work after replacement:
- on clock quartz: 12.1

12.1 Clock frequency

Purpose: Set the precise clock frequency

Indications of incorrect setting:
The clock loses or gains time

The following preparations should be carried out before the setting:

- Call up the Service Test program, select step 99
  After calling this up using Select, the display is switched to dark and it is not possible to operate any functions on the device.
- Measure and note down the frequency on pin 13 from connector plug 1944 to 7 digits (should be approx. 2048 Hz)
- Exit step 99 by resetting the power supply

TP	ADJ.	MODE	INPUT
1900/2		Service Mode, Step 53	

TAPE	MEAS. EQ.	SPEC.
	Frequency counter with 7 digits	refer to description below

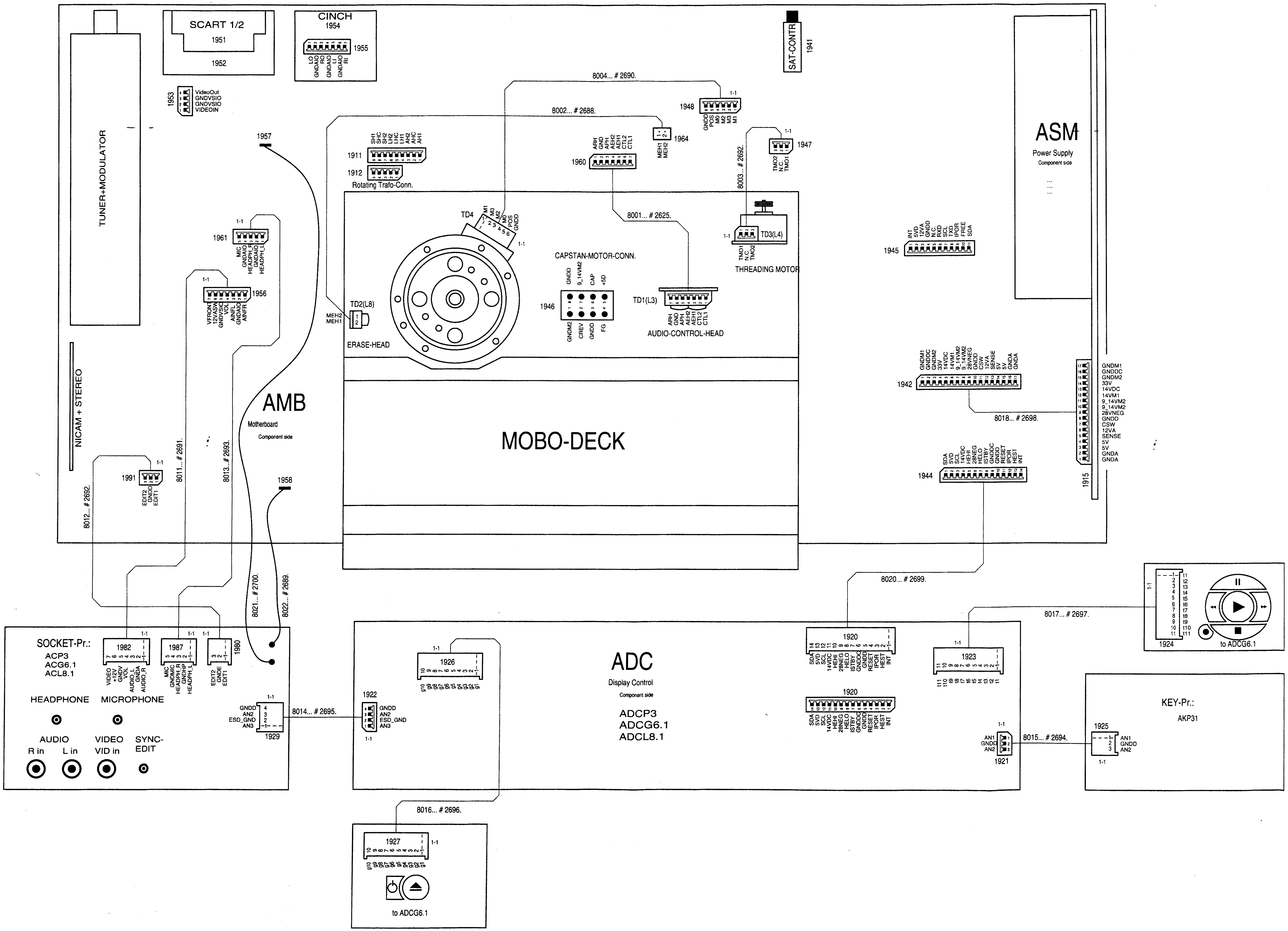
- Call up step 53 of the Service Test program;
  the display should show '--:--:53'
- by the help of the remote, type in the last 4 digits of the measured frequency
  e.g. measured frequency =2048.123 - input 81:23
- Press the 'OK' button;

The microprocessor calculates a correction factor for the clock frequency from the value entered.
If the frequency entered is outside certain limits, 'ERR' will be shown on the display.

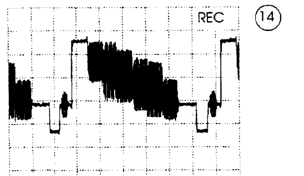
List of Signal Abbreviations

2FSC	2x Colour subcarrier
10SC12	Scart 1/2 Pin 10
8SC1	Scart 1 pin 8 input
8SC1H	Scart 1 pin 8 high level
8SC1M	Scart 1 pin 8 medium level
8SC2	Scart 2 pin 8 input
9_14VM2	Capstan motor supply, switched
A0-19	Adress lines
AEH1/2	Audio erase head
AF1	Audio from frontend, left
AF2	Audio from frontend, right
AFC	Automatic frequency control
AFE	Audio from frontend
AGC	Automatic gain control
AH1/2/C	Audio heads
AIN1L	Audio input scart 1, left
AIN1R	Audio input scart 1, right
AIN2L	Audio input scart 2, left
AIN2R	Audio input scart 2, right
AINBL	Audio left from cinch connector
AINBR	Audio right from cinch connector
AINFL	Audio left from Front connector
AINFR	Audio right from front connector
AMCO	Audio mono to the modulator
AMLP	Audio mono playback
AMLR	Audio mono record
AN1/2	Analog voltage from keyboard matrix
ANIL	NICAM Audio, left
ANIR	NICAM Audio, right
AOUT1L	Audio output from scart 1, left
AOUT1R	Audio output from scart 1, right
AOUT2L	Audio output from scart 2, left
AOUT2R	Audio output from scart 2, right
APH	Audio playback head
ARH	Audio record head
CAGC	Chroma Automatic gain control
CAP	Capstan regulation voltage
CKDET	Colour killer detection
CNR	Chroma Noise Reduction
CPRV	Chrominance PAL record
CREV	Capstan reverse
CROT	Colour rotation
CS0	Chip Select 0
CS1	Chip Select 1
CSCP	Colour phase switching for LP feature mode
CSI	Colour system information
CSP	Chrominance secam playback
CSPO	Chroma to Noise Reduction
CSRV	Chrominance secam record
CSW	9V/17V switching for capstan motor
CSYNC/1/2	Composite sync pulse
CTL1/2	Control track signal
D0-7	Data lines
DC_RESET	Reset Display Control
DRUM	Head wheel control
EDIT1/2	Synchro-Edit control signal
ENVC	Envelope comparator signal
FFP	Feature frame pulse
FGD	Capstan tacho pulse digital
FM1	L+R
FM2	2R
FMAP	FM audio playback
FMAR	FM audio record
FMPV	FM video playback
FMRV	FM video record
FOME	Follow Me (video signals equal)
FSC	Colour subcarrier
FTA	Threading tacho
FTAD	Threading tacho digital
HEHI	Heater for displaytube high
HELO	Heater for displaytube low
HEST	Heater voltage control signal
HP1	Head pulse video
HP2	Head pulse audio
HSC	Head Select Control (SP/LP)
IMEO	Main erase oscillator on/off
INIT	Deck switch
INT	Interrupt
IPOR	Inverse power on reset
IRAF	Inverse record FM-audio
IRAL	Inverse Record Audio Linear
IREV	Inverse Record Video
ISTBY	Inverse stand by
ISWS	Crosstalk Reduction
IWIND	Control pulse amplification low
LH1/2/C	Long play heads
MEH1/2	Main erase head
MON	Loop through pin 16 scart 2/1
MTA	Audio mute
NC	Not connected
ODAT	Shift register bus data
OFP	OSD Frame pulse
PBV	Playback Video
PG_FG	Head wheel position/-speed
PIN10_IN	Pin 10 scart 1/2 output
PIN10_OUT	Pin 10 scart 1/2 input
POR	Power on reset
PSS	PAL/SECAM Switch
RD	Output Enable RAM/ROM
RECP	Record protection
RxD	Receive Data
SB1	Secam band 1
SCL	IIC bus clock
SDA	IIC bus data
SCL2	YCA IIC bus clock
SDA2	YCA IIC bus data
SCL3	High Speed IIC bus clock
SDA3	High Speed IIC bus data
SFS	Sound filter switch
SH1/2/C	Standard play heads
SRCLK	Shift Register Clock
SSIF	Second sound intermediate frequency
STROBE	Strobe pulse for shiftregister
SWIN	Head switching pulse
SYNC	Control track pulse
TAE	Tape end detection
TAS	Tape start detection
THIO	Threading motor in/out
TMO	Loading motor on/off
TRIA_ALM	Tracking information audio / Audio level indication
TRIV	Tracking information video
TxD	Transmit Data
VBS	Video to signal electronics
VCCD1	Signal before Y-CCD
VCCD2	Signal after Y-CCD
VFRONT	Video from front connector
VFV	Video from front end
VIDOUT1	Video output scart 1
VIDOUT2	Video output scart 2
VIDEOIN1	Video input scart 1
VIDEOIN2	Video input scart 2
VISS	Control sync pulse inversion
VOL	headphone volume
VOUT	Video from OSD part
VSB	Video from signal electronics
W_R	Control track write/read
WR	Write enable for RAM
WTL	Wind tacho left
WTLD	Wind tacho left digital
WTR	Wind tacho right
WTRD	Wind tacho right digital

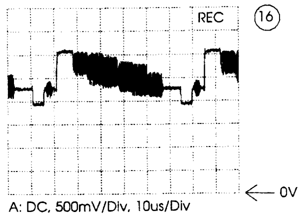
Wiring Diagram


TUNER+MODULATOR
NICAM + STEREO
SCART 1/2
1951
1952
CINCH
1954
1955
LO GNDAIO RO GNDAIO LI GNDAIO RI
1953
VideoOut
GNDVSIO
GNDVSIO
VIDEOIN
SAT-CONTR
1941
8004... # 2690.
8002... # 2688.
1948
GNDD POS M0 M2 M3 M1
1964
MEH1 MEH2
1957
SH1 SHC SH2 LH2 LHC LH1 AH2 AHC AH1
1911
1912
Rotating Trafo-Conn.
ARH GND APH AEH2 AEH1 CTL2 CTL1
1960
1947
TMO2 N.C. TMO1
8003... # 2692.
TD4
M1 M3 M2 M0 POS GNDD
8001... # 2625.
TD3(L4)
TMO1 N.C. TMO2
THREADING MOTOR
CAPSTAN-MOTOR-CONN.
GNDD 9_14VM2 CAP +5D
1946
GNDM2 CREV GNDD FG
TD1(L3)
ARH GND APH AEH2 AEH1 CTL2 CTL1
AUDIO-CONTROL-HEAD
TD2(L8)
MEH2 MEH1
ERASE-HEAD
1961
MIC GNDAIO HEADPH_R GNDAIO HEADPH_L
1956
VFRONT 12VASW GNDVSIO VOL AINFL GNDAIO AINFR
AMB
Motherboard
Component side
MOBO-DECK
ASM
Power Supply
Component side
1945
INT 5VD 12VA GNDD N.C. RXD SCL TXD IPOR FREE SDA
1942
GNDM1 GNDDC GNDM2 33V 14VDC 14VM1 9_14VM2 9_14VM2 28VNEG GNDD CSW 12VA SENSE 5V 5V GNDA GNDA
8018... # 2698.
1915
1944
SDA 5VD SCL 14VDC HEHI 28NEG HELO ISTBY GNDDC GNDD RESET IPOR HEST INT
1991
EDIT2 GNDD EDIT1
8012... # 2692.
8011... # 2691.
8013... # 2693.
1958
8021... # 2700.
8022... # 2689.
8020... # 2699.
8017... # 2697.
SOCKET-Pr.:
ACP3
ACG6.1
ACL8.1
1982
VIDEO +12V GNDV VOL AUDIO_L GNDA AUDIO_R
1987
MIC GNDMIC HEADPH R GNDHP HEADPH_L
1980
EDIT2 GNDE EDIT1
HEADPHONE
MICROPHONE
AUDIO
R in
L in
VIDEO
VID in
SYNC-EDIT
1929
GNDD AN2 ESD_GND AN3
8014... # 2695.
1922
GNDD AN2 ESD_GND AN3
1926
ADC
Display Control
Component side
ADCP3
ADCG6.1
ADCL8.1
1920
SDA 5VD SCL 14VDC HEHI 28NEG HELO ISTBY GNDDC GNDD RESET IPOR HEST INT
1923
1924
to ADCG6.1
1921
AN1 GNDD AN2
8015... # 2694.
KEY-Pr.:
AKP31
1925
AN1 GNDD AN2
8016... # 2696.
1927
to ADCG6.1
1-1

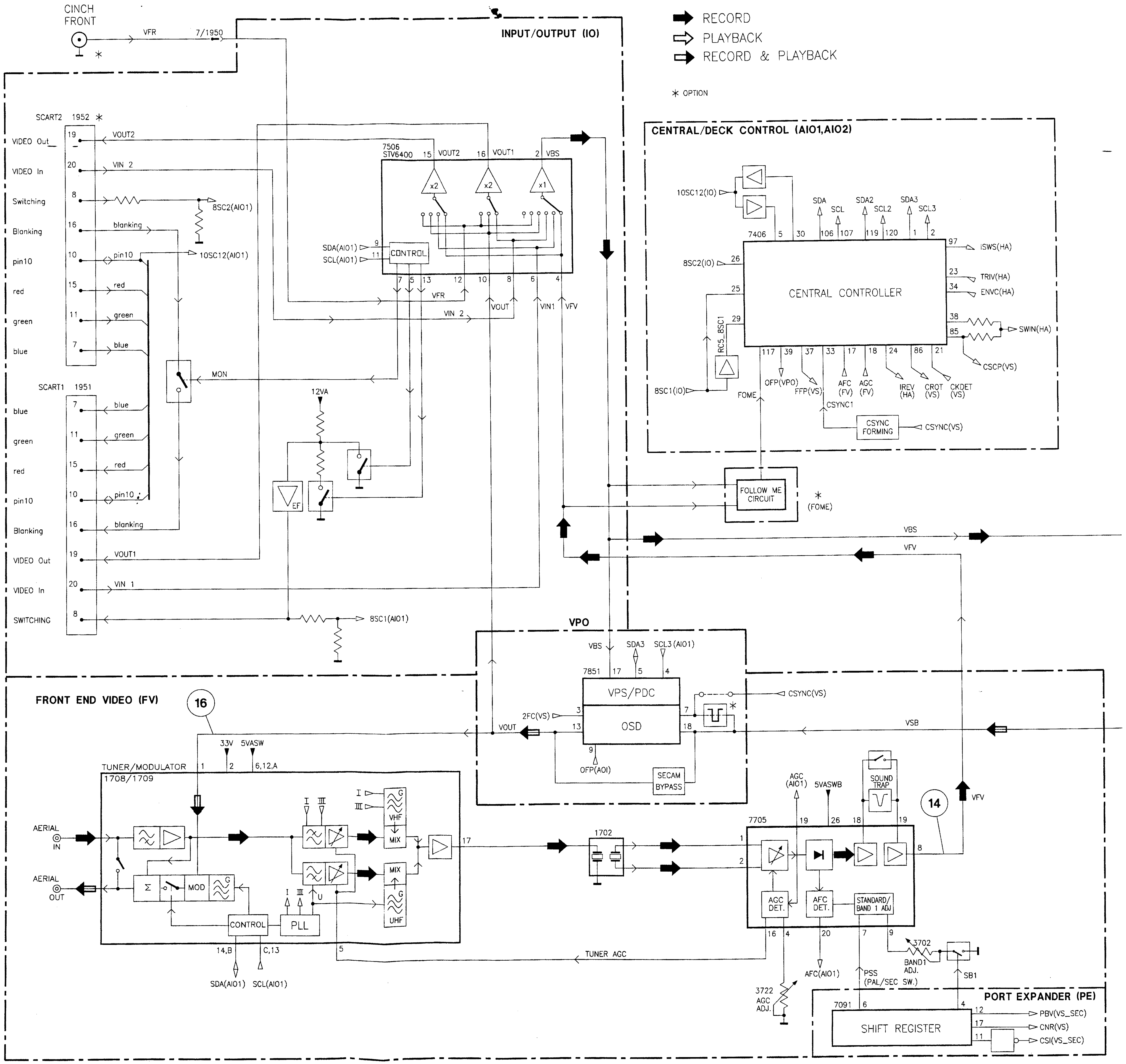
Block Diagram Video



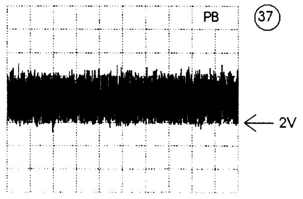
A: DC, 500mV/Div, 10us/Div
IC 7705 Pin 8



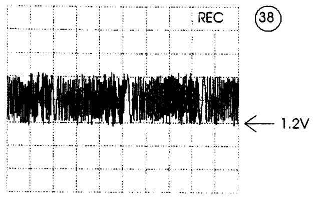
A: DC, 500mV/Div, 10us/Div
Tumod Pin 1


CINCH FRONT
VFR
7/1950
INPUT/OUTPUT (IO)
RECORD
PLAYBACK
RECORD & PLAYBACK
* OPTION
SCART2 1952 *
VIDEO Out
VIDEO In
Switching
Blanking
pin10
red
green
blue
VOUT2
VIN 2
blanking
8SC2(AIO1)
10SC12(AIO1)
SCART1 1951
VOUT1
VIN 1
SWITCHING
8SC1(AIO1)
MON
7506
STV6400
VOUT1
VBS
x2
x1
CONTROL
SDA(AIO1)
SCL(AIO1)
VIN1
VFV
VOUT
12VA
EF
CENTRAL/DECK CONTROL (AIO1,AIO2)
10SC12(IO)
7406
SDA
SCL
SDA2
SCL2
SDA3
SCL3
8SC2(IO)
CENTRAL CONTROLLER
RC5_8SC1
8SC1(IO)
ISWS(HA)
TRIV(HA)
ENVC(HA)
SWIN(HA)
CSCP(VS)
FOME
OFP(VPO)
FFP(VS)
AFC (FV)
AGC (FV)
IREV (HA)
CROT (VS)
CKDET (VS)
CSYNC1
CSYNC FORMING
CSYNC(VS)
FOLLOW ME CIRCUIT
* (FOME)
VBS
VFV
VPO
SDA3
SCL3 (AIO1)
7851
VPS/PDC
OSD
2FC(VS)
OFP(AOI)
SECAM BYPASS
VSB
FRONT END VIDEO (FV)
16
33V
5VASW
TUNER/MODULATOR
1708/1709
AERIAL IN
AERIAL OUT
MOD
CONTROL
PLL
VHF
MIX
UHF
14,B
C,13
SDA(AIO1)
SCL(AIO1)
1702
TUNER AGC
AGC (AIO1)
5VASWB
SOUND TRAP
7705
14
AGC DET.
AFC DET.
STANDARD/BAND 1 ADJ
AFC(AIO1)
PSS (PAL/SEC SW.)
3702
BAND1 ADJ.
SB1
3722 AGC ADJ.
PORT EXPANDER (PE)
7091
SHIFT REGISTER
PBV(VS_SEC)
CNR(VS)
CSI(VS_SEC)

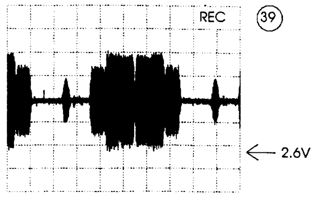
Block Diagram Video



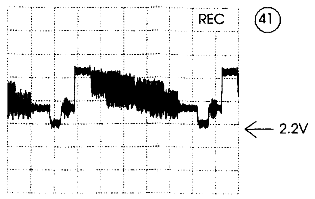
A: AC, 200mV/Div, 20us/Div
IC 7103 Pin 15



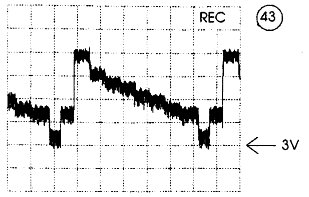
A: AC, 200mV/Div, 20us/Div
FMRV



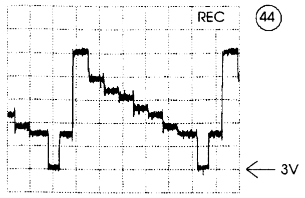
A: AC, 100mV/Div, 10us/Div
CPRV



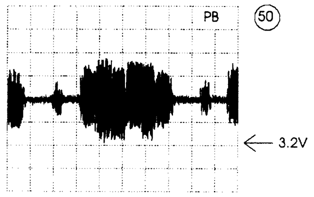
A: AC, 500mV/Div, 10us/Div
IC 7005 Pin 35



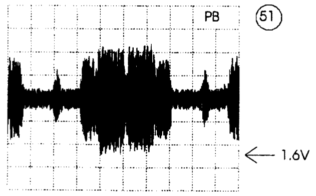
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 40



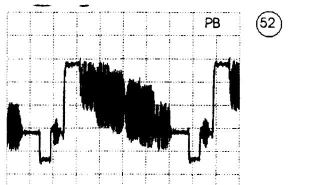
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 26



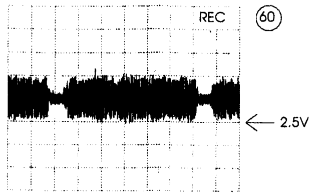
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 52



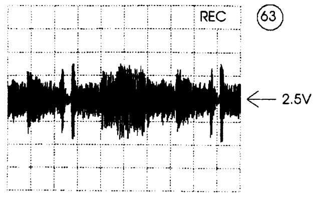
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 45



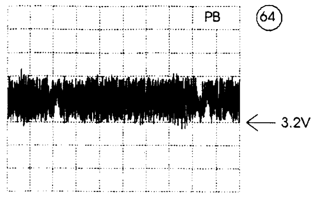
A: DC, 500mV/Div, 10us/Div
IC 7005 Pin 35



A: AC, 100mV/Div, 10us/Div
IC 7066 Pin 29



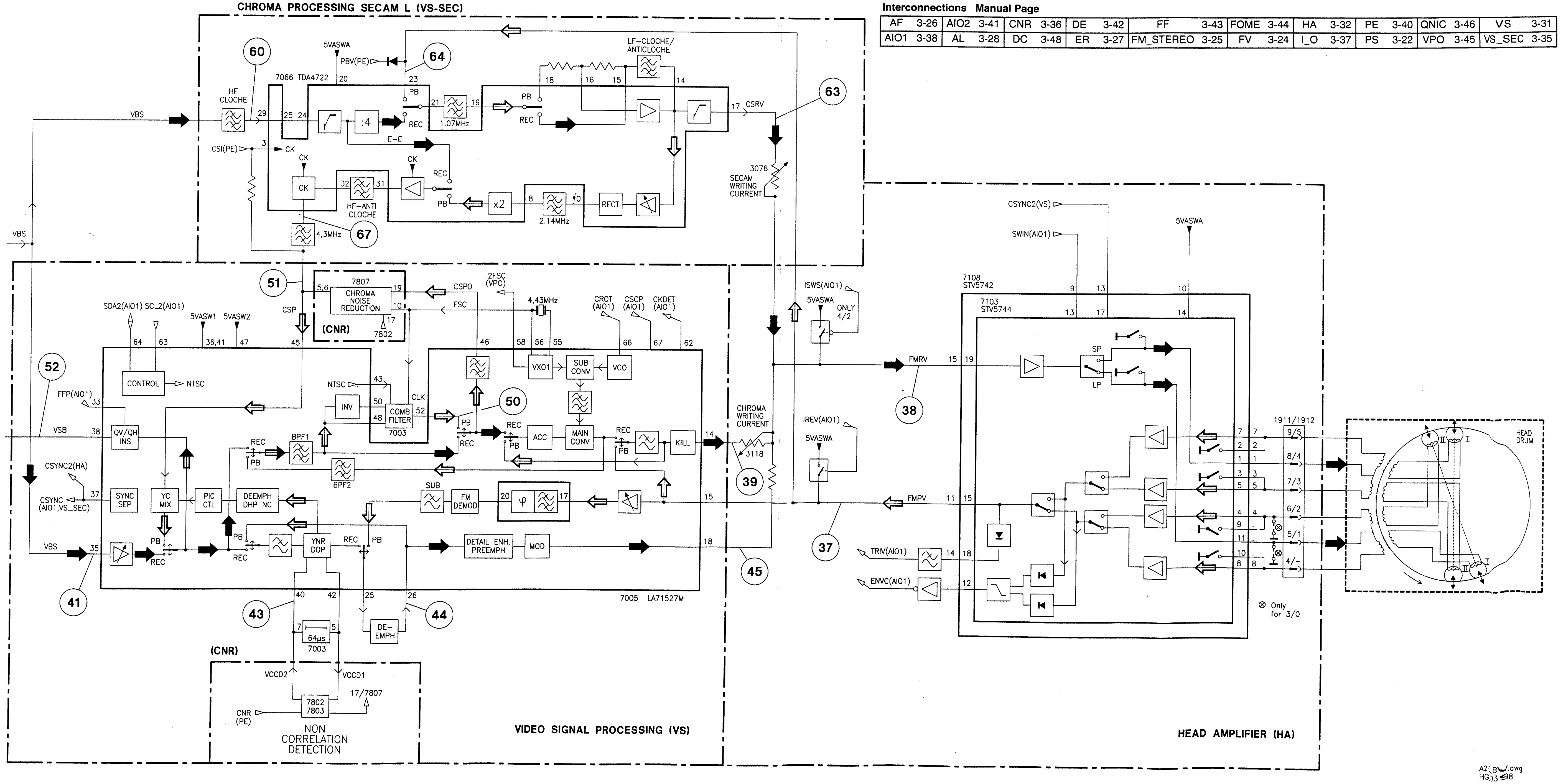
A: AC, 200mV/Div, 10us/Div
IC 7066 Pin 17



A: AC, 200mV/Div, 10us/Div
IC 7066 Pin 23

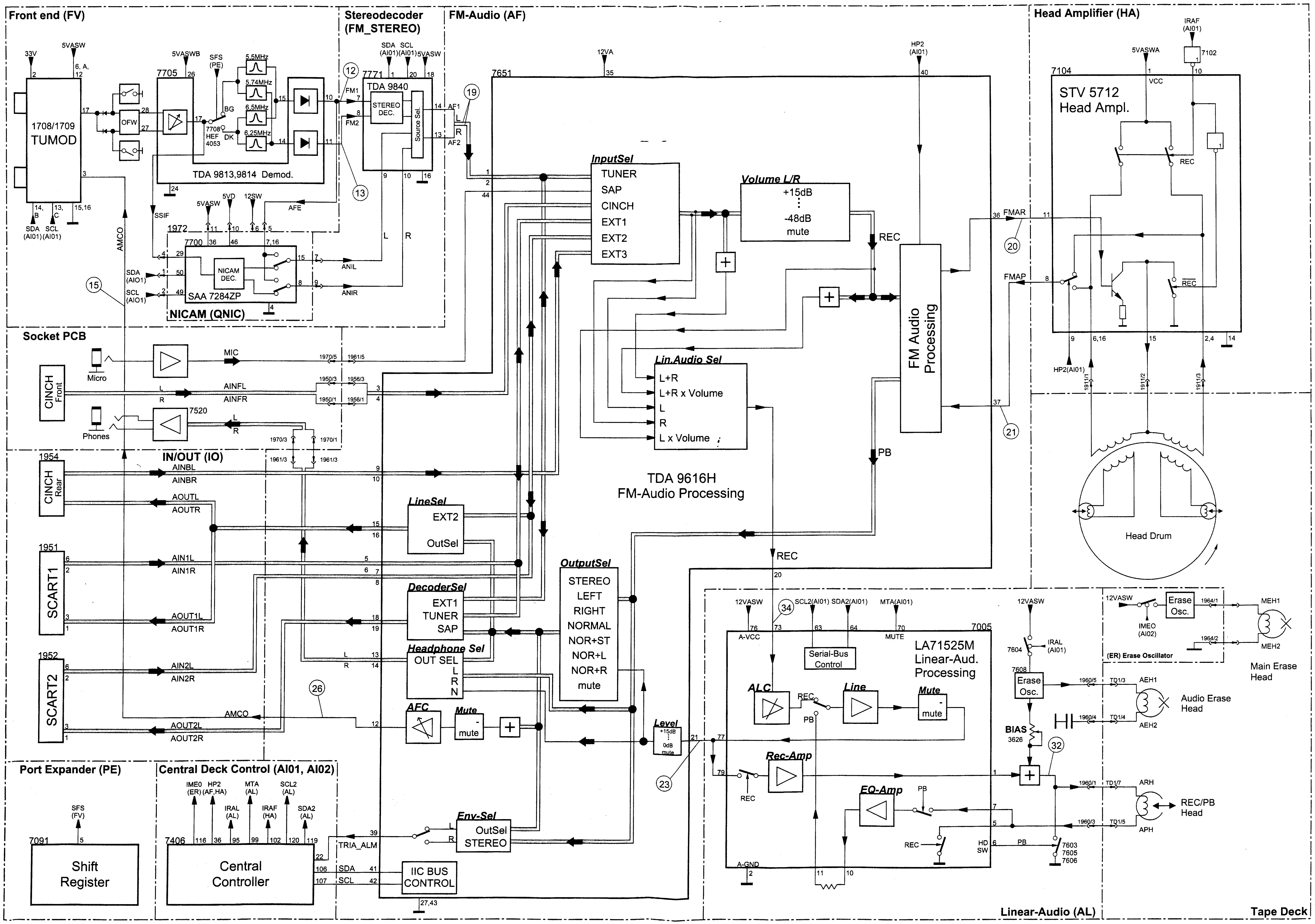
Interconnections Manual Page

AF	3-26	AIO2	3-41	CNR	3-36	DE	3-42	FF	3-43	FOME	3-44	HA	3-32	PE	3-40	QNIC	3-46	VS	3-31
AIO1	3-38	AL	3-28	DC	3-48	ER	3-27	FM_STEREO	3-25	FV	3-24	I_O	3-37	PS	3-22	VPO	3-45	VS_SEC	3-35

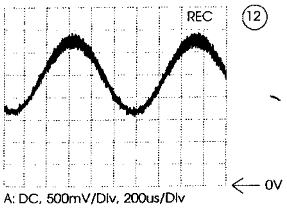

CHROMA PROCESSING SECAM L (VS-SEC)
60
64
63
67
51
5VASWA
PBV(PE)
LF-CLOCHE/
ANTICLOCHE
7066 TDA4722
HF
CLOCHE
VBS
CSI(PE)
CK
:4
REC
PB
E-E
1.07MHz
CSRV
3076
SECAM
WRITING
CURRENT
HF-ANTI
CLOCHE
x2
2.14MHz
RECT
4,3MHz
7807
CHROMA
NOISE
REDUCTION
(CNR)
7802
CSP
CSPO
FSC
2FSC
(VPO)
4,43MHz
CROT
(AIO1)
CSCP
(AIO1)
CKDET
(AIO1)
SDA2(AIO1) SCL2(AIO1)
5VASW1 5VASW2
52
CONTROL
NTSC
FFP(AIO1)
VSB
QV/QH
INS
INV
COMB
FILTER
7003
CLK
50
VXO1
SUB
CONV
VCO
ACC
MAIN
CONV
KILL
BPF1
BPF2
CSYNC2(HA)
CSYNC
(AIO1,VS_SEC)
SYNC
SEP
YC
MIX
PIC
CTL
DEEMPH
DHP NC
SUB
FM
DEMOD
φ
YNR
DOP
DETAIL ENH.
PREEMPH
MOD
41
43
44
45
64μs
DE-
EMPH
7005 LA71527M
VCCD2
VCCD1
17/7807
7802
7803
CNR
(PE)
NON
CORRELATION
DETECTION
VIDEO SIGNAL PROCESSING (VS)
CHROMA
WRITING
CURRENT
3118
39
ISWS(AIO1)
ONLY
4/2
IREV(AIO1)
FMRV
38
FMPV
37
TRIV(AIO1)
ENVC(AIO1)
CSYNC2(VS)
SWIN(AIO1)
7108
STV5742
7103
STV5744
SP
LP
1911/1912
9/5
8/4
7/3
6/2
5/1
4/-
HEAD
DRUM
⊗ Only
for 3/0
HEAD AMPLIFIER (HA)

A2LB[illegible].dwg
HG03[illegible]98
S 93915

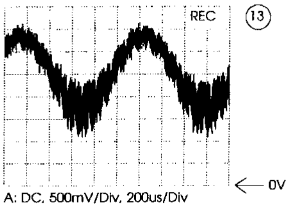
Block Diagram Audio


Front end (FV)
33V
5VASW
1708/1709
TUMOD
SDA (AI01)
SCL (AI01)
OFW
7705
5VASWB
SFS (PE)
5,5MHz
5,74MHz
6,5MHz
6,25MHz
BG
DK
7708 HEF 4053
TDA 9813,9814 Demod.
SSIF
5VASW
5VD
12SW
AFE
1972
7700
NICAM DEC.
SAA 7284ZP
NICAM (QNIC)
ANIL
ANIR
Stereodecoder (FM_STEREO)
SDA (AI01)
SCL (AI01)
5VASW
7771
TDA 9840
STEREO DEC.
Source Sel.
FM1
FM2
AF1
AF2
L
R
FM-Audio (AF)
12VA
HP2 (AI01)
7651
InputSel
TUNER
SAP
CINCH
EXT1
EXT2
EXT3
Volume L/R
+15dB
-48dB
mute
REC
PB
FM Audio Processing
Lin.Audio Sel
L+R
L+R x Volume
L
R
L x Volume
TDA 9616H
FM-Audio Processing
LineSel
EXT2
OutSel
DecoderSel
EXT1
TUNER
SAP
Headphone Sel
OUT SEL
L
R
N
OutputSel
STEREO
LEFT
RIGHT
NORMAL
NOR+ST
NOR+L
NOR+R
mute
AFC
Mute
mute
Level
+15dB
0dB
mute
Env-Sel
OutSel
STEREO
IIC BUS CONTROL
TRIA_ALM
SDA
SCL
AMCO
Socket PCB
Micro
MIC
CINCH Front
AINFL
AINFR
Phones
7520
IN/OUT (IO)
1954
CINCH Rear
AINBL
AINBR
AOUTL
AOUTR
1951
SCART1
AIN1L
AIN1R
AOUT1L
AOUT1R
1952
SCART2
AIN2L
AIN2R
AOUT2L
AOUT2R
Port Expander (PE)
SFS (FV)
7091
Shift Register
Central Deck Control (AI01, AI02)
IMEO (ER)
HP2 (AF,HA)
MTA (AL)
SCL2 (AL)
IRAL (AL)
IRAF (HA)
SDA2 (AL)
7406
Central Controller
Head Amplifier (HA)
IRAF (AI01)
7102
5VASWA
7104
STV 5712
Head Ampl.
VCC
REC
FMAR
FMAP
HP2(AI01)
Head Drum
Linear-Audio (AL)
12VASW
SCL2(AI01)
SDA2(AI01)
MTA(AI01)
7005
A-VCC
MUTE
Serial-Bus Control
LA71525M
Linear-Aud. Processing
ALC
Line
Rec-Amp
EQ-Amp
A-GND
HD SW
7604
IRAL (AI01)
7608
Erase Osc.
BIAS
3626
7603
7605
7606
(ER) Erase Oscillator
IMEO (AI02)
MEH1
MEH2
Main Erase Head
AEH1
AEH2
Audio Erase Head
ARH
APH
REC/PB Head
Tape Deck
12
13
15
19
20
21
23
26
32
34

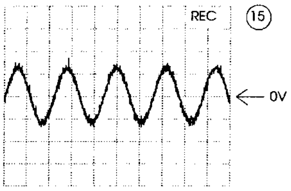
Oscillograms Block Diagram Audio



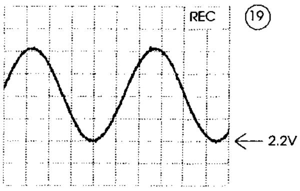
A: DC, 500mV/Div, 200us/Div
IC 7705 Pin 10



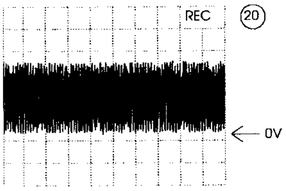
A: DC, 500mV/Div, 200us/Div
IC 7705 Pin 11



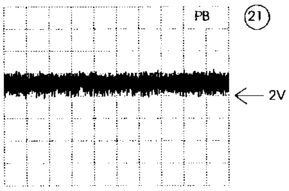
A: DC, 500mV/Div, 500us/Div
Tumod Pin 3



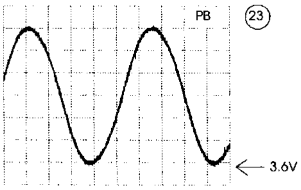
A: AC, 200mV/Div, 200us/Div
IC 7771 Pin 13/14



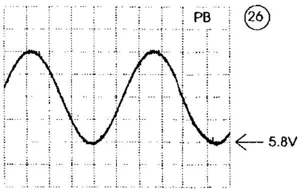
A: DC, 200mV/Div, 5ms/Div
FMAR



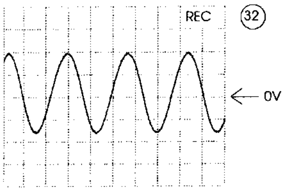
A: AC, 200mV/Div, 500us/Div
FMAP



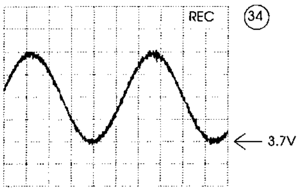
A: AC, 100mV/Div, 200us/Div
IC 7651 Pin 21



A: AC, 200mV/Div, 200us/Div
IC 7651 Pin 18/19



A: DC, 20 V/Div, 5us/Div
Connector 1960 Pin 1

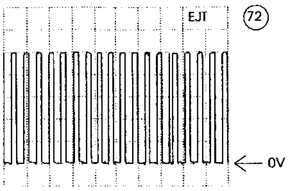


A: AC, 50mV/Div, 200us/Div
IC 7005 Pin 73

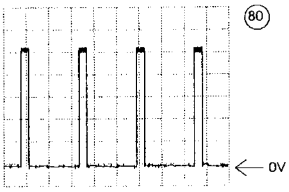
Interconnections Manual Page

AF 3-26	AIO2 3-41	CNR 3-36	DE 3-42	FF 3-43	FOME 3-44	HA 3-32	PE 3-40	QNIC 3-46	VS 3-31
AIO1 3-38	AL 3-28	DC 3-48	ER 3-27	FM_STEREO 3-25	FV 3-24	I_O 3-37	PS 3-22	VPO 3-45	VS_SEC 3-35

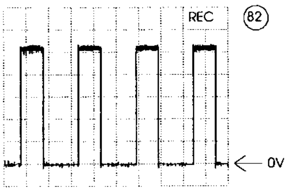
Oscillograms Block Diagram Digital



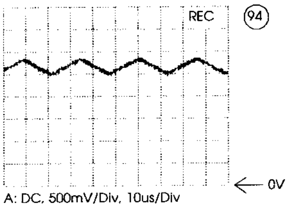
A: DC, 1 V/Div, 20ms/Div
IC 7406 Pin 3



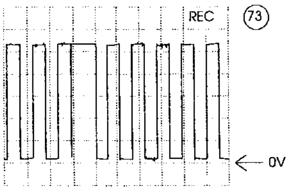
A: DC, 1 V/Div, 10us/Div
IC 7406 Pin 89



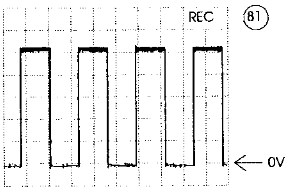
A: DC, 1 V/Div, 10us/Div
IC 7406 Pin 87



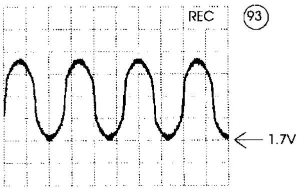
A: DC, 500mV/Div, 10us/Div
Connector 1946 Pin 6



A: DC, 1 V/Div, 2ms/Div
IC 7406 Pin 28



A: DC, 1 V/Div, 10us/Div
IC 7406 Pin 88

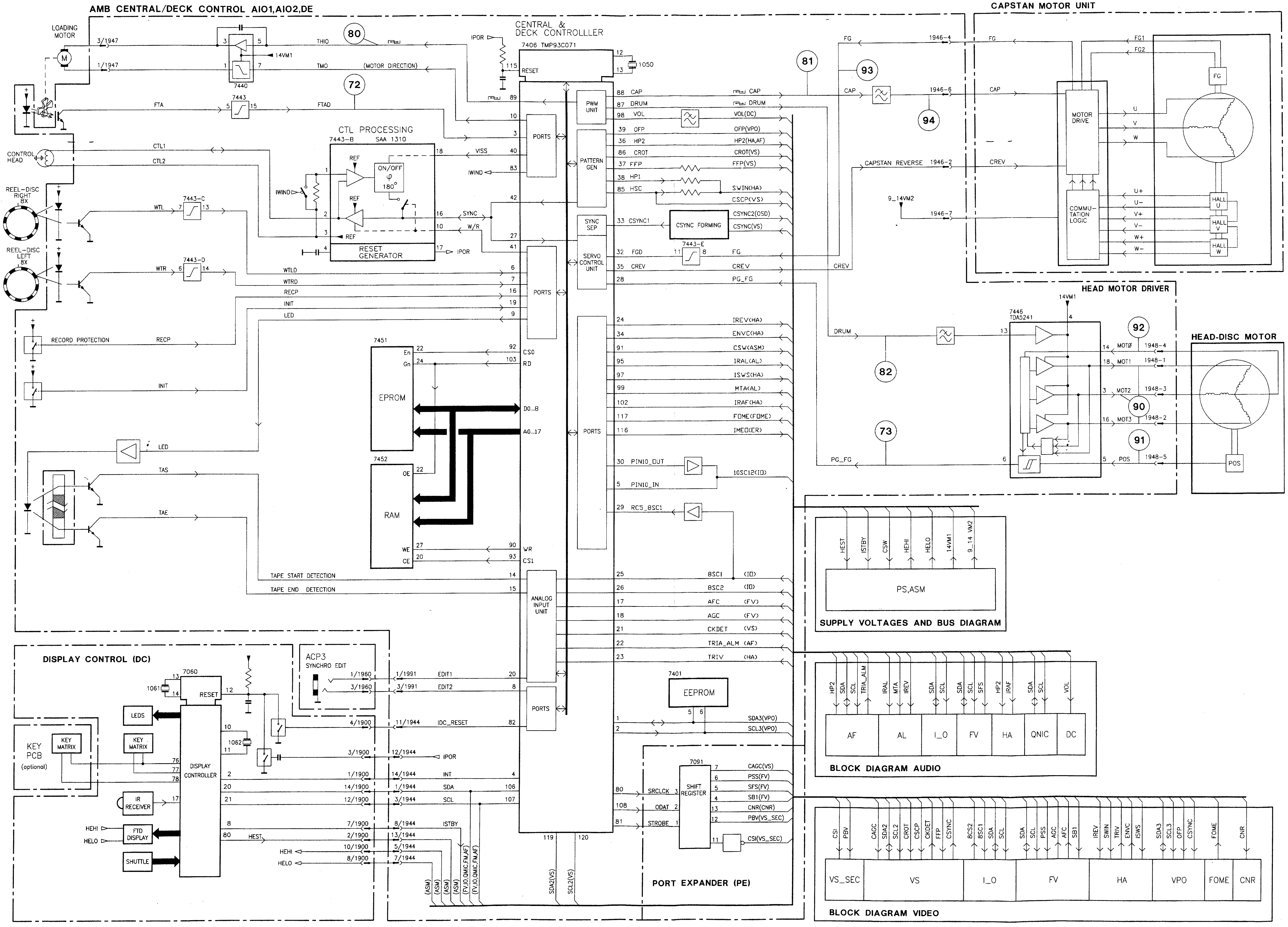


A: DC, 500mV/Div, 500us/Div
Connector 1946 Pin 4

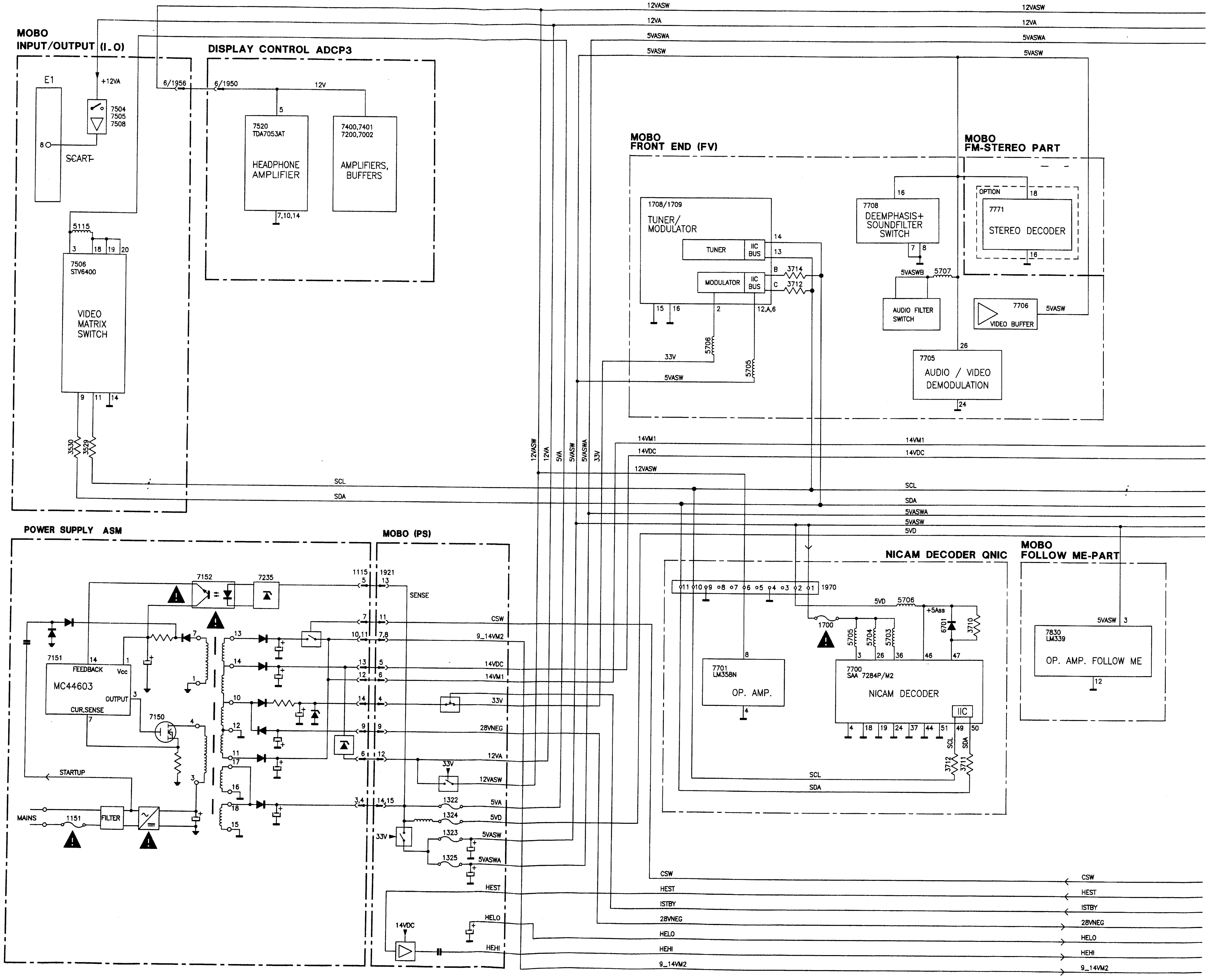
Interconnections Manual Page

AF	3-26	AIO2	3-41	CNR	3-36	DE	3-42	FF	3-43	FOME	3-44	HA	3-32	PE	3-40	QNIC	3-46	VS	3-31
AIO1	3-38	AL	3-28	DC	3-48	ER	3-27	FM_STEREO	3-25	FV	3-24	I_O	3-37	PS	3-22	VPO	3-45	VS_SEC	3-35

Block Diagram Digital

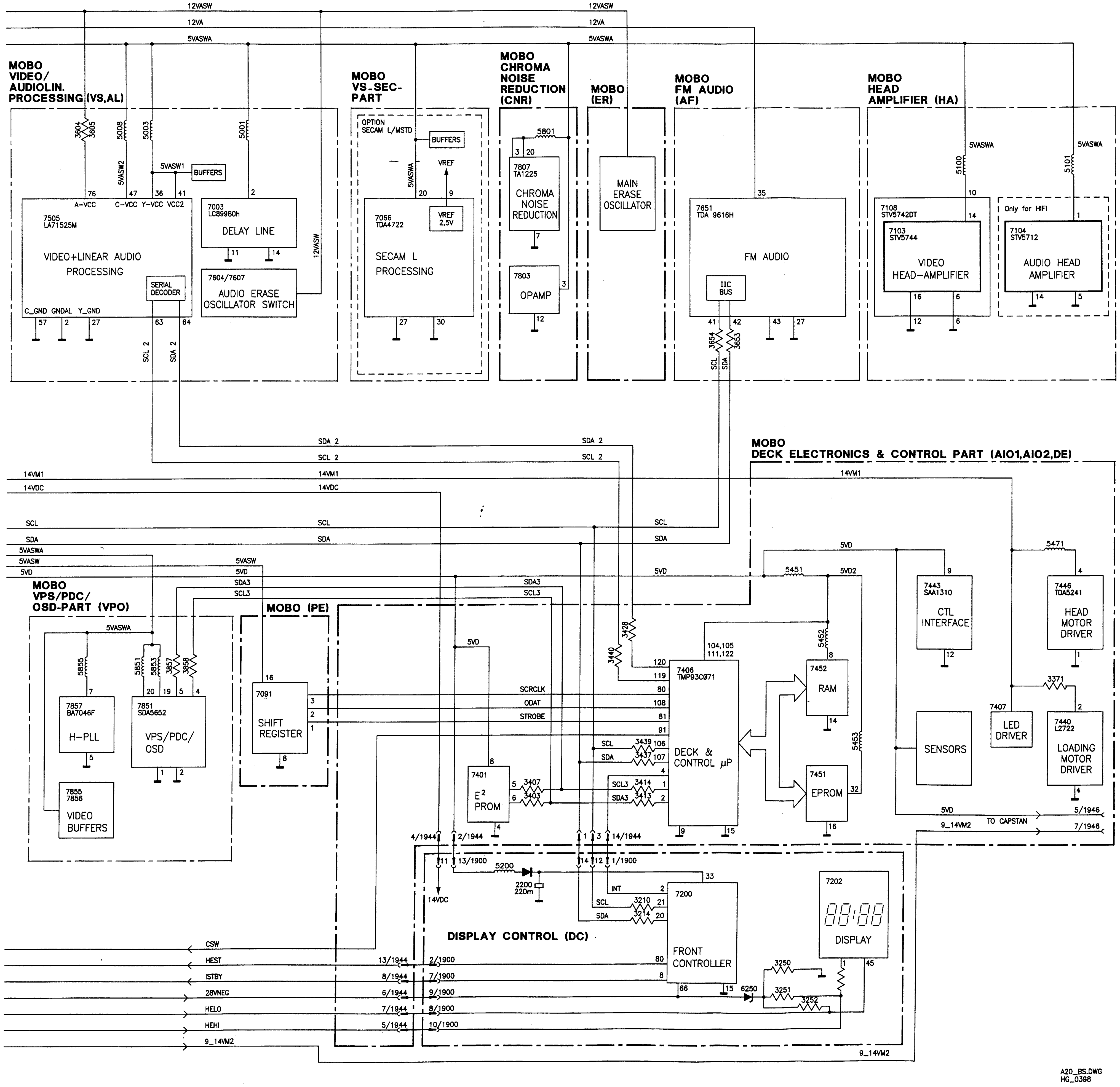

AMB CENTRAL/DECK CONTROL AIO1,AIO2,DE
CAPSTAN MOTOR UNIT
HEAD MOTOR DRIVER
HEAD-DISC MOTOR
LOADING MOTOR
CONTROL HEAD
REEL-DISC RIGHT 8X
REEL-DISC LEFT 8X
RECORD PROTECTION
CTL PROCESSING
7443-B SAA 1310
RESET GENERATOR
CENTRAL & DECK CONTROLLLER
7406 TMP93C071
PWM UNIT
PORTS
PATTERN GEN
SYNC SEP
SERVO CONTROL UNIT
ANALOG INPUT UNIT
CSYNC FORMING
EPROM
RAM
EEPROM
7451
7452
7401
7440
7443
7443-C
7443-D
7443-E
MOTOR DRIVE
COMMU-TATION LOGIC
7446 TDA5241
HALL U
HALL V
HALL W
FG
POS
CAPSTAN REVERSE
DISPLAY CONTROL (DC)
7060
DISPLAY CONTROLLER
LEDS
KEY MATRIX
KEY PCB (optional)
IR RECEIVER
FTD DISPLAY
SHUTTLE
ACP3 SYNCHRO EDIT
PORT EXPANDER (PE)
7091
SHIFT REGISTER
SUPPLY VOLTAGES AND BUS DIAGRAM
PS,ASM
HEST
ISTBY
CSW
HEHI
HELO
14VM1
9_14 VM2
BLOCK DIAGRAM AUDIO
AF
AL
I_O
FV
HA
QNIC
DC
BLOCK DIAGRAM VIDEO
VS_SEC
VS
I_O
FV
HA
VPO
FOME
CNR
80
81
93
94
72
82
92
90
91
73
CAP
DRUM
VOL(DC)
OFP(VPO)
HP2(HA,AF)
CROT(VS)
FFP(VS)
SWIN(HA)
CSCP(VS)
CSYNC2(OSD)
CSYNC(VS)
FG
CREV
PG_FG
IREV(HA)
ENVC(HA)
CSW(ASM)
IRAL(AL)
ISWS(HA)
MTA(AL)
IRAF(HA)
FOME(FOME)
IMEO(ER)
10SC12(IO)
8SC1 (IO)
8SC2 (IO)
AFC (FV)
AGC (FV)
CKDET (VS)
TRIA_ALM (AF)
TRIV (HA)
SDA3(VPO)
SCL3(VPO)
CAGC(VS)
PSS(FV)
SFS(FV)
SB1(FV)
CNR(CNR)
PBV(VS_SEC)
CSI(VS_SEC)
TAPE START DETECTION
TAPE END DETECTION
EDIT1
EDIT2
IDC_RESET
IPOR
INT
SDA
SCL
ISTBY
HEST
HEHI
HELO
SDA2(VS)
SCL2(VS)

Block Diagram Supply & I²C


MOBO
INPUT/OUTPUT (I_O)
E1
+12VA
7504
7505
7508
8
SCART
5115
3
18
19
20
7506
STV6400
VIDEO MATRIX SWITCH
9
11
14
3530
3529
DISPLAY CONTROL ADCP3
6/1956
6/1950
12V
5
7520
TDA7053AT
HEADPHONE AMPLIFIER
7,10,14
7400,7401
7200,7002
AMPLIFIERS, BUFFERS
12VASW
12VA
5VASWA
5VASW
MOBO
FRONT END (FV)
1708/1709
TUNER/
MODULATOR
TUNER
IIC BUS
MODULATOR
14
13
B
C
3714
3712
15
16
2
12,A,6
5706
5705
33V
MOBO
FM-STEREO PART
7708
DEEMPHASIS+ SOUNDFILTER SWITCH
7
8
5VASWB
5707
AUDIO FILTER SWITCH
OPTION
7771
STEREO DECODER
7706
VIDEO BUFFER
7705
AUDIO / VIDEO DEMODULATION
26
24
33V
14VM1
14VDC
SCL
SDA
5VD
POWER SUPPLY ASM
7152
7235
7151
FEEDBACK
Vcc
MC44603
OUTPUT
CUR.SENSE
7150
STARTUP
MAINS
1151
FILTER
MOBO (PS)
1115
1921
SENSE
CSW
9_14VM2
14VDC
14VM1
33V
28VNEG
12VA
12VASW
5VA
5VD
5VASW
5VASWA
1322
1324
1323
1325
HEST
HELO
HEHI
14VDC
NICAM DECODER QNIC
1970
5706
+5Ass
1700
5705
5704
5703
6701
3710
7701
LM358N
OP. AMP.
7700
SAA 7284P/M2
NICAM DECODER
IIC
3712
3711
MOBO
FOLLOW ME-PART
7830
LM339
OP. AMP. FOLLOW ME
ISTBY
28VNEG

MOBO ... MOTHERBOARD

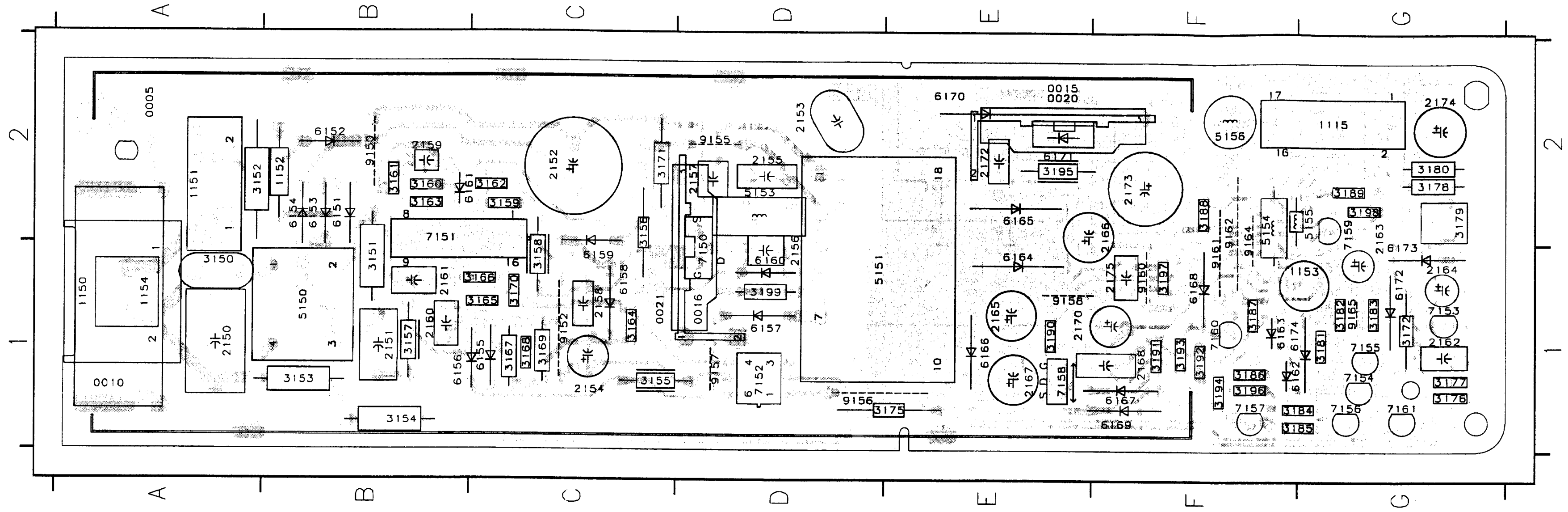
Block Diagram Supply & I^{2}C

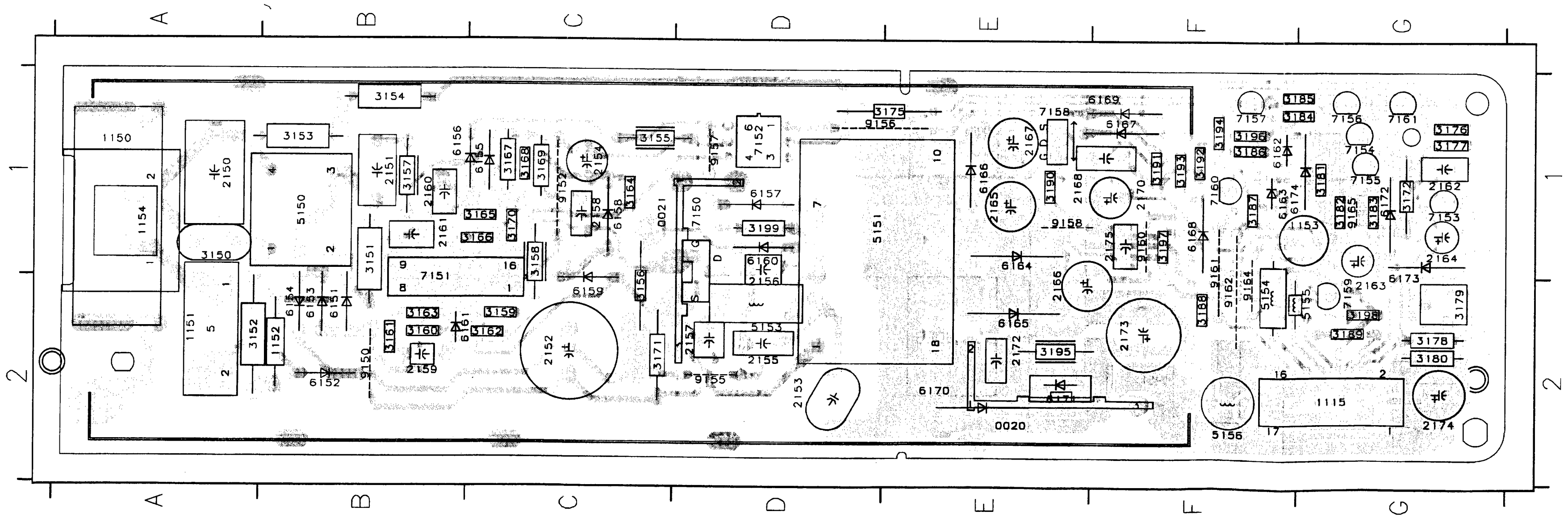


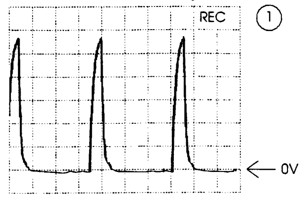
12VASW
12VA
5VASWA
MOBO VIDEO/ AUDIOLIN. PROCESSING (VS,AL)
3604
3605
5008
5003
5001
5VASW2
5VASW1
BUFFERS
76
47
36
41
2
A-VCC
C-VCC Y-VCC VCC2
7505 LA71525M
VIDEO+LINEAR AUDIO PROCESSING
SERIAL DECODER
C_GND GNDAL Y_GND
57
2
27
63
64
7003 LC89980h
DELAY LINE
11
14
7604/7607
AUDIO ERASE OSCILLATOR SWITCH
12VASW
SCL 2
SDA 2
MOBO VS-SEC-PART
OPTION SECAM L/MSTD
BUFFERS
5VASWA
VREF
20
9
7066 TDA4722
VREF 2,5V
SECAM L PROCESSING
27
30
MOBO CHROMA NOISE REDUCTION (CNR)
5801
3
20
7807 TA1225
CHROMA NOISE REDUCTION
7
7803
OPAMP
3
12
MOBO (ER)
MAIN ERASE OSCILLATOR
MOBO FM AUDIO (AF)
35
7651 TDA 9616H
FM AUDIO
IIC BUS
41
42
43
27
3654
3653
SCL
SDA
MOBO HEAD AMPLIFIER (HA)
5VASWA
5100
10
7108 STV5742DT
14
7103 STV5744
VIDEO HEAD-AMPLIFIER
16
6
12
6
5VASWA
5101
Only for HIFI
1
7104 STV5712
AUDIO HEAD AMPLIFIER
14
5
SDA 2
SCL 2
14VM1
14VDC
SCL
SDA
5VASWA
5VASW
5VD
MOBO DECK ELECTRONICS & CONTROL PART (AIO1,AIO2,DE)
14VM1
5VD
5471
5451
5VD2
9
4
7443 SAA1310
CTL INTERFACE
12
7446 TDA5241
HEAD MOTOR DRIVER
1
3371
2
7407
LED DRIVER
7440 L2722
LOADING MOTOR DRIVER
4
SENSORS
3428
3440
5452
8
104,105
111,122
120
119
80
108
81
91
106
107
4
1
2
7406 TMP93C071
DECK & CONTROL µP
9
15
7452
RAM
14
5453
7451
EPROM
32
16
5VD
9_14VM2
TO CAPSTAN
5/1946
7/1946
MOBO VPS/PDC/ OSD-PART (VPO)
5VASWA
5855
5851
5853
3857
3858
7
20
19
5
4
7857 BA7046F
H-PLL
5
7851 SDA5652
VPS/PDC/ OSD
1
2
7855 7856
VIDEO BUFFERS
5VASW
5VD
SDA3
SCL3
MOBO (PE)
16
7091
SHIFT REGISTER
3
2
1
8
5VD
SCRCLK
ODAT
STROBE
SCL
SDA
3439
3437
SCL3
SDA3
3414
3413
8
7401
E^2 PROM
5
6
3407
3403
4
4/1944
2/1944
1
3
14/1944
11
13/1900
14
12
1/1900
5200
2200 220m
14VDC
33
INT
2
7200
SCL
3210
21
SDA
3214
20
DISPLAY CONTROL (DC)
FRONT CONTROLLER
80
8
66
15
6250
7202
88:88
DISPLAY
1
45
3250
3251
3252
CSW
HEST
ISTBY
28VNEG
HELO
HEHI
9_14VM2
13/1944
8/1944
6/1944
7/1944
5/1944
2/1900
7/1900
9/1900
8/1900
10/1900
9_14VM2
A20_BS.DWG
HG_0398

Power Supply (ASM)

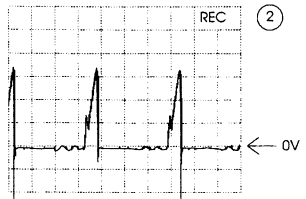
0005	A2
0010	A1
0015	E2
0016	D1
0020	E2
0021	C1
1115	G2
1150	A1
1151	A2
1152	B2
1153	G1
1154	A1
2150	A1
2151	B1
2152	C2
2153	D2
2154	C1
2155	D2
2156	D1
2157	D2
2158	C1
2159	B2
2160	B1
2161	B1
2162	G1
2163	G2
2164	G1
2165	E1
2166	F2
2167	E1
2168	F1
2170	E1
2172	E2
2173	F2
2174	G2
2175	F1
3150	A1
3151	B1
3152	A2
3153	B1
3154	B1
3155	C1
3156	C2
3157	B1
3158	C1
3159	C2
3160	B2
3161	B2
3162	C2
3163	B2
3164	C1
3165	C1
3166	C1
3167	C1
3168	C1
3169	C1
3170	C1
3171	C2
3172	G1
3175	E1
3176	G1
3177	G1
3178	G2
3179	G2
3180	G2
3181	G1
3182	G1
3183	G1
3184	G1
3185	G1
3186	F1
3187	F1
3188	F2
3189	G2
3190	E1
3191	F1
3192	F1
3193	F1
3194	F1
3195	E2
3196	F1
3197	F1
3198	G2
3199	D1
5150	B1
5151	D1
5153	D2
5154	F2
5155	G2
5156	F2
6151	B2
6152	B2
6153	B2
6154	B2
6155	C1
6156	B1
6157	D1
6158	C1
6159	C1
6160	D1
6161	B2
6162	F1
6163	F1
6164	E1
6165	E2
6166	E1
6167	F1
6168	F1
6169	F1
6170	E2
6171	E2
6172	G1
6173	G1
6174	F1
7150	D1
7151	B2
7152	D1
7153	G1
7154	G1
7155	G1
7156	G1
7157	F1
7158	E2
7159	G2
7160	F1
7161	G1
9150	B2
9152	C1
9155	D2
9156	D1
9157	D1
9158	E1
9160	F1
9161	F1
9162	F2
9164	F2
9165	G1



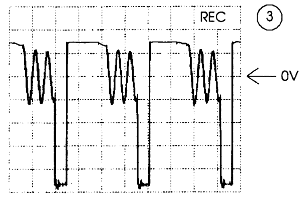




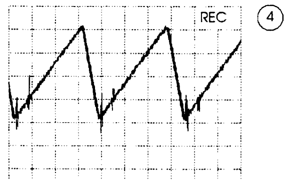
A: DC, 2 V/Div, 5us/Div
Gate 7150



A: DC, 200mV/Div, 5us/Div
Source 7150

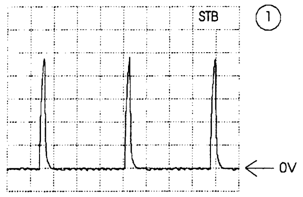


A: DC, 10 V/Div, 5us/Div
5151 Pin 7

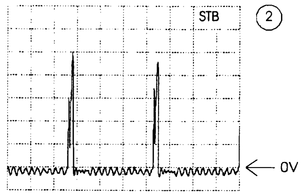


A: DC, 500mV/Div, 5us/Div
IC 7151 Pin 10

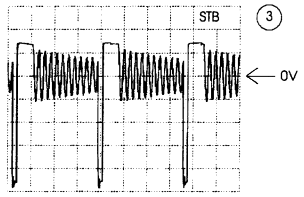
Low Power Standby



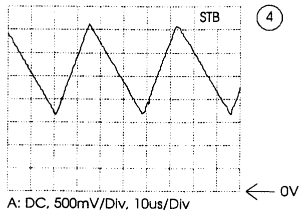
A: DC, 2 V/Div, 10us/Div
Gate 7150



A: DC, 100mV/Div, 10us/Div
Source 7150



A: DC, 10 V/Div, 10us/Div
5151 Pin 7



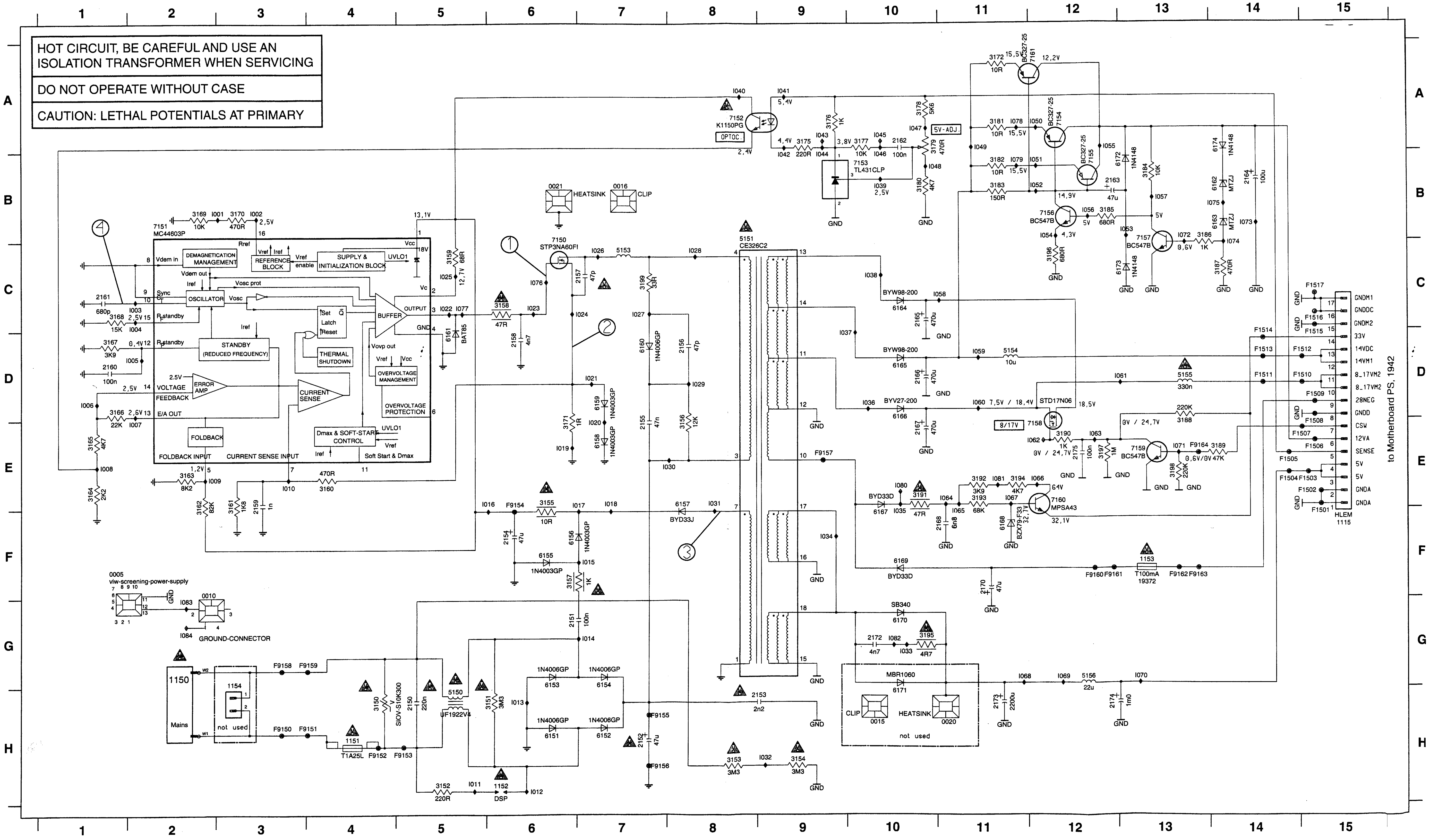
A: DC, 500mV/Div, 10us/Div
IC 7151 Pin 10

Power Supply (ASM)

Interconnections Manual Page

AF 3-26	AIO2 3-41	CNR 3-36	DE 3-42	FF 3-43	FOME 3-44	HA 3-32	PE 3-40	QNIC 3-46	VS 3-31
AIO1 3-38	AL 3-28	DC 3-48	ER 3-27	FM_STEREO 3-25	FV 3-24	I_O 3-37	PS 3-22	VPO 3-45	VS_SEC 3-35

0005 F1
0010 F2
0015 H10
0016 B7
0020 H11
0021 B6
1115 F15
1150 G2
1151 H4
1152 H6
1153 F13
1154 G3
2150 H5
2151 G6
2152 H7
2153 H9
2154 F6
2155 E7
2156 D8
2157 C7
2158 D6
2159 E3
2160 D1
2161 C1
2162 A10
2163 B12
2164 B14
2165 C10
2166 D10
2167 E10
2168 F11
2170 F11
2172 G10
2173 H11
2174 H12
2175 E12
3150 H4
3151 H6
3152 H5
3153 H8
3154 H9
3155 E6
3156 E8
3157 F6
3158 C6
3159 C5
3160 E4
3161 E3
3162 E2
3163 E2
3164 E1
3165 E1
3166 D1
3167 D1
3168 C1
3169 B2
3170 B3
3171 E6
3172 A11
3175 A9
3176 A9
3177 A10
3178 A10
3179 A10
3180 B10
3181 A11
3182 B11
3183 B11
3184 B13
3185 B12
3186 B13
3187 C14
3188 E13
3189 E14
3190 E12
3191 E10
3192 E11
3193 E11
3194 E11
3195 G10
3196 C12
3197 E12
3198 E13
3199 C7
5150 H5
5151 B8
5153 C7
5154 D11
5155 D13
5156 G12
6151 H6
6152 H7
6153 G6
6154 G7
6155 F6
6156 F6
6157 E8
6158 E7
6159 D7
6160 D7
6161 D5
6162 B14
6163 B14
6164 C10
6165 D10
6166 D10
6167 F10
6168 F11
6169 F10
6170 G10
6171 H10
6172 B13
6173 C13
6174 A14
7150 C6
7151 B2
7152 A8
7153 B10
7154 A12
7155 B12
7156 B12
7157 C13
7158 E12
7159 E13
7160 E12
7161 A12
F1501 F15
F1502 E15
F1503 E15
F1504 E14
F1505 E14
F1506 E15
F1507 E15
F1508 E15
F1509 D15
F1510 D15
F1511 D14
F1512 D15
F1513 D14
F1514 D14
F1515 D15
F1516 C15
F1517 C15
F9150 H3
F9151 H4
F9152 H4
F9153 H5
F9154 E6
F9155 H7
F9156 H7
F9157 E9
F9158 G3
F9159 G4
F9160 F12
F9161 F12
F9162 F13
F9163 F13
F9164 E13
I001 B3
I002 B3
I003 C2
I004 C2
I005 D2
I006 D1
I007 E2
I008 E1
I009 E2
I010 E3
I011 H5
I012 H6
I013 H6
I014 G7
I015 F7
I016 E6
I017 E7
I018 E7
I019 E6
I020 E7
I021 D7
I022 C5
I023 C6
I024 C7
I025 C5
I026 C7
I027 C7
I028 C8
I029 D8
I030 E8
I031 E8
I032 H9
I033 G10
I034 F9
I035 F10
I036 D10
I037 D9
I038 C10
I039 B10
I040 A8
I041 A9
I042 B9
I043 A9
I044 B9
I045 A10
I046 B10
I047 A10
I048 B10
I049 A11
I050 A12
I051 B12
I052 B12
I053 B13
I054 B12
I055 A12
I056 B12
I057 B13
I058 C11
I059 D11
I060 D11
I061 D13
I062 E12
I063 E12
I064 E11
I065 F11
I066 E12
I067 E11
I068 G11
I069 G12
I070 G13
I071 E13
I072 B13
I073 B14
I074 C14
I075 B14
I076 C6
I077 C5
I078 A11
I079 B11
I080 E10
I081 E11
I082 G10
I083 G2
I084 G2



HOT CIRCUIT, BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING

DO NOT OPERATE WITHOUT CASE

CAUTION: LETHAL POTENTIALS AT PRIMARY

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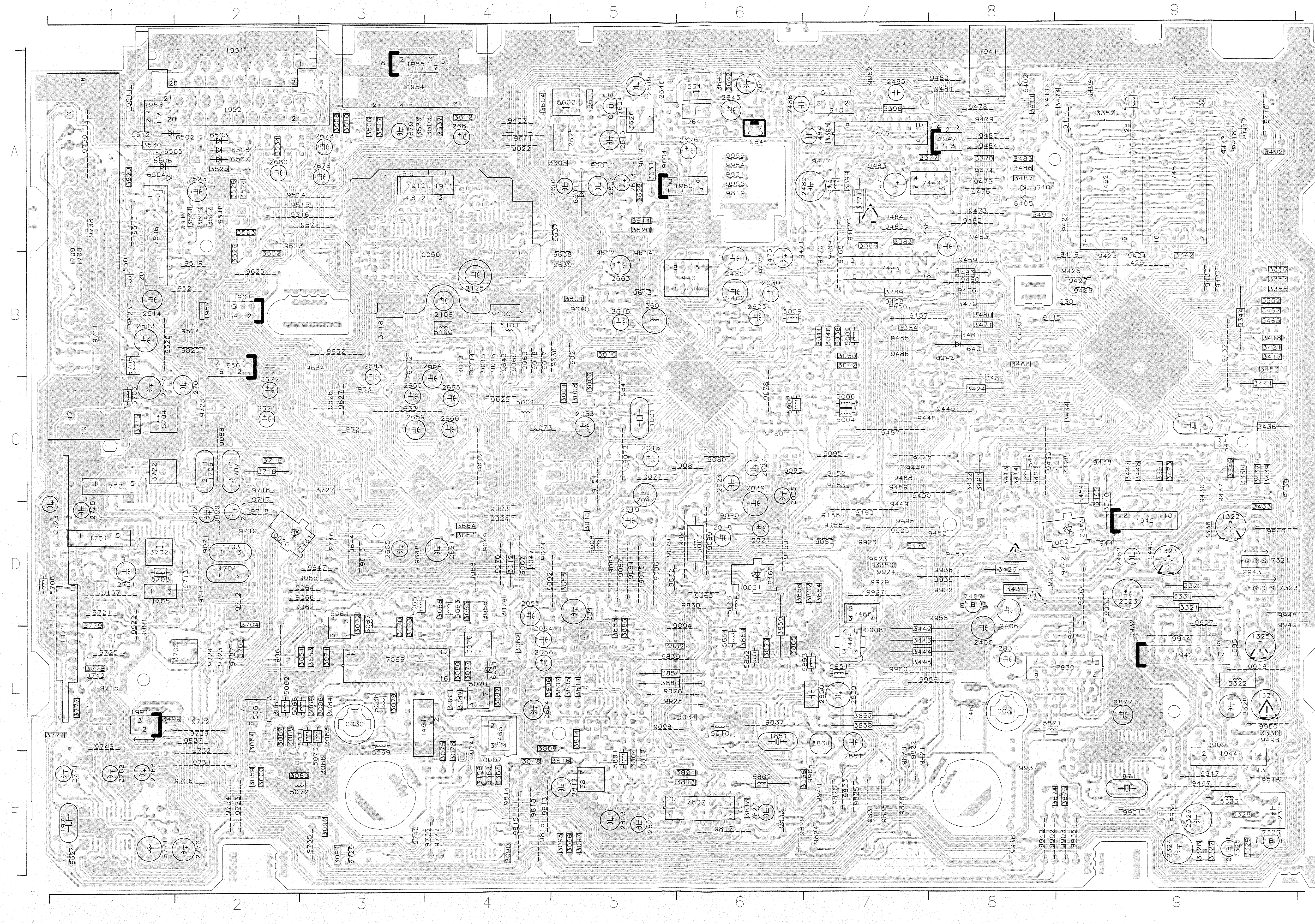
A
B
C
D
E
F
G
H
7151
MC44603P
3169 10K
I001
3170 470R
I002
2,5V
16
Rref
DEMAGNETICATION MANAGEMENT
Vdem in
Vdem out
REFERENCE BLOCK
Vref
Iref
Vref enable
SUPPLY & INITIALIZATION BLOCK
UVLO1
Vcc
18V
13,1V
3159 68R
12,7V
I025
Vc
OSCILLATOR
Sync
CT
Vosc
Vosc prot
Set Q̄ Latch Reset
BUFFER
OUTPUT
GND
STANDBY (REDUCED FREQUENCY)
RF standby
RP standby
THERMAL SHUTDOWN
Vovp out
OVERVOLTAGE MANAGEMENT
OVERVOLTAGE PROTECTION
2.5V
ERROR AMP
VOLTAGE FEEDBACK
E/A OUT
CURRENT SENSE
FOLDBACK
FOLDBACK INPUT
CURRENT SENSE INPUT
Dmax & SOFT-START CONTROL
Soft Start & Dmax
2161 680p
I003
3168 15K
2,5V
I004
3167 3K9
0,4V
I005
2160 100n
2,5V
I006
3166 22K
2,6V
I007
3165 4K7
I008
3164 2K2
1,2V
3163 8K2
I009
3162 82K
3161 1K8
2159 1n
I010
470R 3160
I022
I077
6161 BAT85
3158 47R
I023
2158 4n7
7150
STP3NA60FI
I076
I026
5153
2157 47p
I024
I021
6159 1N4003GP
I020
6158 1N4003GP
3171 1R
I019
3199 33R
I027
6160 1N4006GP
2156 47p
I029
2155 47n
3156 12K
I030
I028
5151
CE326C2
0021 HEATSINK
0016 CLIP
I040
7152
K1150PG
OPTOC.
2,4V
I041
5,4V
4,4V
3175 220R
I042
I043
I044
3176 1K
3,8V
3177 10K
I045
I046
2162 100n
7153
TL431CLP
I039
2,5V
GND
3178 5K6
I047
5V-ADJ.
3179 470R
I048
3180 4K7
3172 10R
15,5V
BC327-25
7161
12,2V
3181 10R
I078
15,5V
I050
BC327-25 7154
I049
3182 10R
I079
15,5V
I051
BC327-25 7155
I055
3183 150R
I052
14,9V
2163 47u
6172 1N4148
3184 10K
I057
7156
BC547B
I056
3185 680R
5V
I054
4,3V
3196 680R
I053
7157
BC547B
6173 1N4148
I072
3186 1K
0,6V
I074
3187 470R
6174 1N4148
6162 MTZJ
I075
6163 MTZJ
2164 100u
I073
I038
BYW98-200
6164
I058
2165 470u
I037
BYW98-200
6165
2166 470u
I059
5154 10u
I036
BYV27-200
6166
2167 470u
I060
7,5V / 18,4V
STD17N06
18,5V
8/17V
7158
I062
3190 1K
0V / 24,7V
2175 100n
I063
3197 1M
220K 3188
0V / 24,7V
7159
BC547B
I071
F9164
3189 47K
0,6V/0V
3198 220K
I061
5155 330n
F9157
BYD33D
6167
I080
I035
3191 47R
I064
I065
2168 6n8
3192 3K9
I081
3194 4K7
I066
3193 68K
I067
6168 BZX79-F33
32,7V
64V
7160
MPSA43
32,1V
I034
6169
BYD33D
2170 47u
F9160
F9161
1153
T100mA
19372
F9162
F9163
SB340
6170
2172 4n7
I082
I033
3195 4R7
MBR1060
6171
CLIP 0015
HEATSINK 0020
not used
2173 2200u
I068
I069
5156 22u
2174 1m0
I070
2153 2n2
3153 3M3
I032
3154 3M3
I016
F9154
3155 10R
I017
I018
6157
BYD33J
I031
2154 47u
6156 1N4003GP
6155 1N4003GP
I015
3157 1K
2151 100n
I014
0005
viw-screening-power-supply
I083
0010
I084
GROUND-CONNECTOR
1150
Mains
1154
not used
F9158
F9159
F9150
F9151
1151
T1A25L
F9152
F9153
3150
SIOV-S10K300
2150 220n
5150
UF1922V4
3151 3M3
I013
1N4006GP 6153
1N4006GP 6154
1N4006GP 6151
1N4006GP 6152
F9155
2152 47u
F9156
3152 220R
I011
1152
DSP
I012
F1517
GNDM1
F1516
GNDDC
F1515
GNDM2
F1514
33V
F1513
F1512
14VDC
14VM1
F1511
F1510
8_17VM2
8_17VM2
F1509
28NEG
F1508
GNDD
F1507
CSW
F1506
12VA
F1505
SENSE
F1504
F1503
5V
5V
F1502
GNDA
F1501
GNDA
HLEM
1115
to Motherboard PS, 1942

Motherboard (MOBO)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1951
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1942
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1991
7066
7443
7446
7440
7462
7807
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7465
7466
0030
0031
0021
0022
0020
0007
0008
1001
1851
5322
5321
7321
7323
PCS 93924

Component Mapping Motherboard

0007	F4
0008	E7
0020	D2
0021	D6
0022	D9
0030	E3
0031	E8
0050	B4
1001	C5
1322	D9
1323	D9
1324	E9
1325	E9
1451	C9
1460	E8
1461	E3
1701	D1
1702	C1
1703	D2
1704	D2
1705	D1
1706	C2
1707	C2
1708	B1
1709	B1
1851	E6
1871	F9
1911	A4
1912	A3
1941	A8
1942	E9
1944	F9
1945	D9
1946	B6
1947	A8
1948	A7
1951	A2
1952	A2
1953	A1
1954	A3
1955	A3
1956	B2
1957	B2
1960	A6
1961	B2
1964	A6
1971	F1
1972	E1
1991	E1
2015	C5
2018	D6
2019	D5
2021	D6
2024	C6
2027	C6
2030	B6
2035	C6
2039	C6
2047	D5
2053	C5
2054	E4
2055	D4
2056	E4
2106	B4
2125	B4
2323	D9
2324	F9
2325	F9
2326	F9
2328	E9
2400	E8
2406	E8
2452	D9
2462	B6
2471	A8
2472	A7
2475	B6
2480	B6
2484	A7
2485	A7
2486	A6
2489	A7
2513	B1
2514	B1
2523	A2
2602	A5
2603	B5
2607	A5
2609	A5
2613	A5
2615	A5
2616	B5
2623	B6
2625	A5
2626	A6
2641	A6
2643	A6
2644	A6
2646	A5
2651	D4
2655	C3
2659	C3
2660	C4
2664	B4
2665	C4
2671	C2
2672	C2
2673	A3
2676	A3
2679	A3
2680	A2
2681	A4
2683	B3
2685	D3
2701	C2
2713	D2
2717	C1
2722	D2
2723	D1
2725	D1
2734	D1
2771	F1
2776	F2
2782	F1
2783	F1
2804	E4
2812	F5
2822	F5
2823	F5
2827	F6
2831	E8
2839	E7
2841	D5
2850	E7
2851	F7
2861	E7
2877	E9
3001	C5
3006	C5
3008	C5
3010	B5
3011	D5
3012	D4
3030	B7
3034	E6
3035	F7
3038	B7
3040	B7
3041	B7
3042	B7
3047	D4
3048	F4
3059	F2
3060	F2
3061	E2
3062	E4
3063	D4
3064	E2
3065	D4
3066	D4
3067	E2
3068	E2
3069	E3
3070	E3
3071	E3
3072	E3
3073	E3
3074	D4
3075	F4
3076	E4
3077	E4
3078	F4
3079	E3
3080	E4
3081	E4
3082	E4
3083	E3
3084	E3
3086	F3
3087	E4
3088	E3
3089	F3
3090	F4
3091	F3
3092	F3
3095	F5
3096	F5
3097	F5
3118	B3
3321	D9
3322	D9
3326	F9
3327	F9
3328	F9
3329	F9
3330	E9
3331	D9
3336	D9
3340	D9
3342	B9
3344	B9
3345	C9
3351	C9
3352	B9
3353	B9
3355	B9
3356	B9
3357	A9
3358	C9
3363	F4
3364	F4
3370	A8
3371	A7
3377	A8
3380	D7
3381	A7
3383	A7
3384	B7
3386	A7
3389	B7
3395	A7
3396	A7
3399	A7
3411	A8
3413	C8
3414	C8
3417	B9
3418	B9
3420	C8
3421	B9
3424	C8
3426	D8
3428	C9
3431	D8
3432	C8
3433	D9
3434	C9
3436	C9
3437	C9
3439	C9
3441	C9
3442	E7
3443	E7
3444	E7
3445	E7
3447	C9
3448	C9
3453	B9
3456	F4
3465	B9
3466	B8
3467	B9
3470	D7
3471	B8
3473	C9
3474	A9
3479	B8
3480	B8
3481	B8
3482	C8
3483	B8
3485	A8
3486	A8
3487	A8
3491	A8
3492	A9
3493	C8
3495	D9
3499	E1
3503	A4
3506	A3
3508	A3
3510	A3
3512	A4
3517	A3
3519	A2
3523	A2
3524	A2
3525	A2
3526	B2
3527	A2
3528	A2
3529	A1
3530	A1
3531	A2
3532	B2
3534	A2
3536	A3
3537	A4
3601	B5
3604	A4
3605	A5
3611	A5
3614	A5
3620	A5
3622	A5
3626	A5
3631	A5
3640	A6
3642	A6
3651	D4
3653	E3
3654	E3
3664	D4
3702	E2
3703	E2
3704	E2
3715	C1
3716	C2
3718	C2
3722	C1
3727	C3
3771	E1
3777	E1
3778	E1
3779	E1
3804	F5
3805	E5
3806	E4
3807	E5
3808	F4
3811	E5
3812	F5
3813	F6
3814	E5
3816	F5
3817	F5
3818	F6
3821	F6
3854	E5
3855	D5
3857	E7
3858	E7
3859	E6
3862	D7
3863	E6
3864	D7
3865	E6
3866	D6
3869	E6
3874	F8
3875	F9
3880	E5
3882	E5
3885	E5
3886	E5
5001	C4
5002	C6
5003	D6
5004	C7
5005	B7
5006	C7
5008	D5
5009	B6
5010	E6
5061	E2
5062	E2
5063	D4
5064	D3
5065	D3
5066	E2
5067	E3
5068	E3
5069	F3
5070	E4
5071	E3
5072	F3
5073	F3
5100	B4
5101	B4
5322	E9
5323	F9
5451	C8
5452	A9
5453	C9
5454	C9
5471	A7
5501	B1
5601	B5
5602	A5
5641	A6
5702	D1
5703	C1
5704	C1
5705	B1
5706	D1
5708	D1
5771	F1
5801	F5
5802	F6
5851	E7
5852	E6
5853	E7
5854	E6
5856	D6
5871	E8
6061	E4
6401	B8
6402	A8
6404	A8
6405	A8
6460	D6
6502	A2
6503	A2
6504	A1
6505	A1
6506	A1
6507	A2
6508	A2
6601	A5
7066	E3
7321	D9
7323	D9
7325	F9
7326	F9
7407	D8
7440	A8
7443	B7
7446	A7
7451	A9
7452	A9
7461	D3
7462	D9
7464	E7
7465	E4
7466	D7
7506	A1
7604	A5
7807	F6
7830	E9
9012	B3
9013	B4
9014	B4
9015	B4
9016	B4
9017	B4
9018	B4
9019	A5
9021	B5
9022	A4
9023	D4
9024	D4
9025	C4
9061	E2
9062	D3
9063	B4
9064	D3
9065	D3
9066	D3
9067	D4
9068	D4
9069	B4
9070	D4
9071	D2
9072	C5
9073	C4
9074	D4
9075	D5
9076	E5
9077	C5
9078	C6
9079	D5
9080	C6
9081	C6
9082	D7
9083	C6
9084	D5
9085	D5
9086	D5
9087	D5
9088	C2
9089	D6
9090	D6
9091	E1
9092	D4
9094	E6
9095	C7
9097	D6
9098	E5
9099	D2
9100	B4
9152	C7
9153	C7
9154	C5
9155	D7
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9158	D7
9159	D6
9160	C6
9301	B9
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9404	A9
9411	A8
9414	A9
9415	B8
9416	A9
9417	A9
9418	A9
9419	B9
9421	F7
9422	A9
9423	B9
9424	B9
9425	B9
9426	B9
9427	B9
9428	B9
9429	B8
9430	B9
9431	B9
9432	B9
9433	A9
9435	C8
9436	C9
9437	C9
9438	C9
9439	C9
9440	D9
9441	D9
9442	D9
9445	C8
9446	C7
9447	C7
9448	C7
9449	D7
9450	C7
9452	D8
9453	D8
9454	B8
9455	B7
9456	B7
9457	B7
9458	B7
9459	B8
9460	B8
9462	A8
9463	A8
9464	A7
9465	A7
9466	B8
9467	A7
9468	B7
9469	B7
9470	B7
9471	B6
9472	B6
9473	A8
9474	A8
9475	A8
9476	A8
9477	A7
9478	A8
9479	A8
9480	A8
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9483	A7
9484	A8
9485	A8
9486	B7
9487	C7
9488	C7
9489	C7
9490	D7
9495	D7
9496	E9
9497	F9
9511	A1
9512	A1
9513	A1
9514	A2
9515	A3
9516	A3
9517	A2
9518	A2
9519	B2
9520	B1
9521	B2
9522	E1
9523	B1
9524	B2
9601	A5
9604	A5
9611	A4
9612	B5
9613	B5
9614	B5
9621	C3
9622	A3
9623	A2
9624	F1
9625	B2
9626	C3
9627	C3
9631	C3
9632	B3
9633	C3
9634	B3
9636	B5
9637	A5
9638	B5
9639	B5
9640	B5
9641	C5
9642	C4
9643	B4
9644	D3
9645	D3
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9647	D3
9648	D3
9649	D4
9711	B1
9712	D2
9713	D2
9714	D2
9715	E1
9716	C2
9717	D2
9718	D2
9719	D2
9721	D1
9722	E2
9723	E2
9724	E2
9725	E1
9726	F2
9727	E2
9728	C2
9729	F3
9730	A1
9731	F2
9732	F2
9733	F2
9734	F2
9735	F3
9736	F4
9737	F4
9738	A1
9739	E2
9740	F3
9741	E4
9742	E1
9743	E1
9813	F4
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9816	F4
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9819	A6
9820	B2
9821	A5
9822	F7
9823	F7
9824	F7
9825	F7
9826	F7
9827	E2
9829	F6
9830	D6
9831	F7
9832	D5
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9835	F7
9836	F7
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9839	E5
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9904	F9
9905	D7
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9908	E9
9909	E9
9922	D8
9923	D7
9924	D7
9925	E5
9926	D7
9927	D7
9929	D7
9932	E9
9933	D9
9934	F9
9935	F9
9936	F8
9937	F8
9938	D8
9939	D8
9940	F7
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9942	F8
9943	D9
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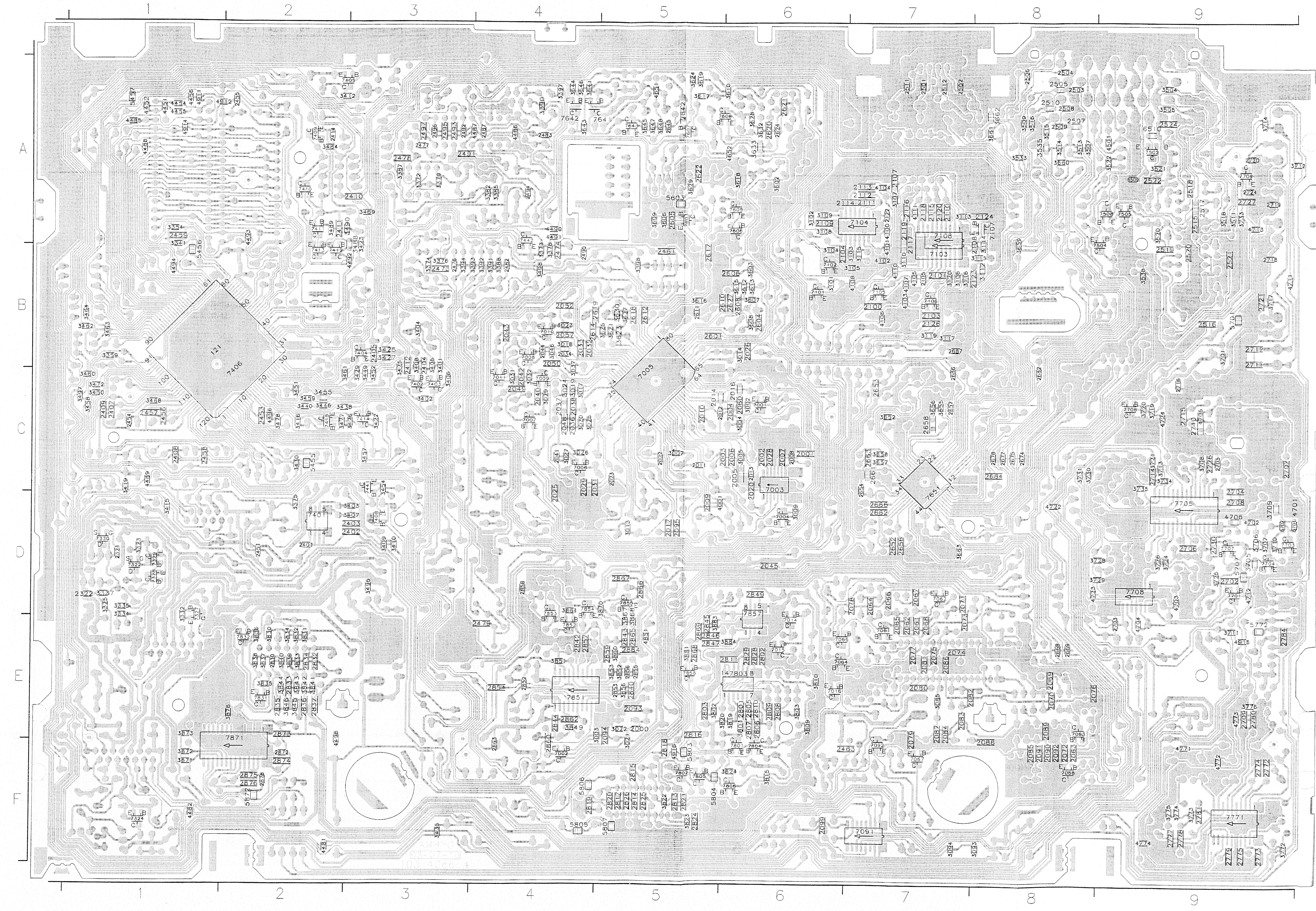
9946	D9
9947	F9
9948	D9
9949	E9
9950	E9
9951	E9
9952	D8
9953	D9
9954	A6
9955	A6
9956	E8
9958	D8
9959	A6
9960	E7
9962	A7
9963	D6
9965	F7

Component Mapping Motherboard

2000	E5	2479	E4	2834	E2	3446	C2	3834	E2	7106	B7
2001	C6	2482	B4	2835	E2	3449	C3	3835	E2	7107	A8
2002	C6	2483	A4	2836	E2	3450	C1	3836	E2	7108	A7
2003	C5	2487	A4	2837	E2	3451	C2	3837	E2	7322	D1
2004	C6	2490	B4	2840	E5	3452	C3	3838	E2	7324	F1
2005	C6	2491	A3	2842	E4	3454	C3	3839	E2	7327	D1
2006	C6	2492	A3	2843	E5	3455	C2	3840	E2	7328	D1
2007	C6	2493	A3	2844	E4	3457	C3	3841	E2	7329	D1
2008	C6	2494	A4	2845	E5	3458	C1	3842	E2	7330	D1
2009	D5	2495	A3	2846	E5	3459	C2	3843	E2	7401	D2
2010	C5	2496	A3	2847	E5	3460	C1	3844	E2	7402	C3
2011	C5	2497	A3	2849	D6	3461	C2	3845	E2	7403	C3
2012	C5	2501	A7	2852	E4	3462	B1	3846	E2	7404	B3
2013	C6	2502	A7	2853	E5	3463	B1	3849	E4	7405	A2
2014	C5	2503	A8	2854	E4	3464	B1	3851	E4	7406	C2
2016	C6	2504	A8	2855	E5	3468	C1	3852	E5	7408	D3
2017	D5	2505	A8	2856	E5	3469	A3	3853	E5	7409	A2
2020	C6	2506	A8	2857	E4	3472	C1	3856	E5	7410	A2
2022	C5	2507	A8	2858	D4	3475	B3	3860	E5	7411	A2
2023	C5	2508	A8	2859	E5	3476	C3	3861	D4	7412	B2
2025	D4	2509	A8	2860	F4	3477	C2	3867	E5	7413	B2
2026	B6	2510	A8	2862	E4	3478	C2	3868	E5	7414	C3
2028	C6	2511	A7	2863	F4	3484	A2	3870	D5	7415	C2
2029	C4	2512	A7	2864	E5	3488	B3	3871	F1	7441	C3
2031	C4	2515	A9	2865	E5	3489	A2	3872	F1	7442	A4
2032	B4	2516	B9	2866	D5	3490	A2	3873	E1	7502	A9
2033	B4	2517	A9	2867	D5	3496	D3	3876	E2	7504	A9
2034	B4	2518	A9	2868	E5	3497	C1	3881	E5	7505	A9
2036	C4	2519	B9	2869	E5	3498	B4	3883	E5	7508	A9
2037	C4	2520	B9	2872	F2	3504	A9	3884	E6	7603	A5
2038	C4	2521	B9	2873	E2	3505	A9	4001	D5	7605	A6
2040	C4	2522	A9	2874	F2	3507	A8	4100	A7	7606	A6
2041	C4	2524	A9	2875	F2	3509	A8	4101	B7	7607	A5
2042	C4	2601	B5	2876	F2	3511	A9	4102	B7	7608	A5
2043	B4	2604	B6	2878	F2	3513	A8	4103	B7	7641	A5
2044	B4	2605	A5	3002	C6	3514	A8	4104	A7	7642	A4
2045	D6	2606	B6	3003	E5	3515	A8	4105	B7	7643	A5
2048	C4	2608	B6	3004	C6	3516	A8	4106	B7	7651	C7
2049	C4	2610	B5	3005	C6	3518	A9	4107	B7	7701	D9
2050	B4	2611	B5	3007	C5	3520	A9	4108	B7	7703	D9
2052	B4	2612	B5	3009	D6	3521	A9	4110	B7	7704	D9
2057	B4	2614	B4	3013	D5	3522	A9	4111	A7	7705	D9
2060	C6	2617	B5	3014	B6	3533	A8	4451	A1	7706	C9
2061	E7	2618	B5	3017	C4	3535	A8	4452	A1	7707	D9
2062	E7	2619	B4	3018	B4	3538	B9	4454	A1	7708	D9
2063	F8	2620	A6	3019	C4	3602	A6	4455	A1	7709	A9
2064	D7	2621	A6	3020	C4	3603	B6	4456	A1	7771	F9
2065	E7	2622	A5	3021	F5	3606	A5	4481	F2	7801	F6
2066	D7	2624	A6	3022	E5	3607	B6	4482	F1	7802	F5
2067	D7	2627	B6	3023	B4	3608	B6	4485	A1	7803	E6
2068	E7	2642	A5	3024	C4	3609	A5	4486	A4	7804	F6
2069	E8	2645	A5	3025	C4	3610	A6	4487	A3	7805	F5
2070	E8	2652	D7	3026	C4	3612	B6	4488	A1	7806	F6
2071	D7	2653	C7	3027	C4	3613	B6	4489	C1	7831	E2
2072	F8	2654	C7	3029	C4	3615	B6	4490	A4	7832	E2
2073	E7	2656	D7	3031	C4	3616	B5	4491	A4	7851	E4
2074	E7	2657	C7	3032	C4	3617	A5	4492	B2	7852	E4
2075	E7	2658	C7	3037	B4	3618	A6	4493	A2	7853	D4
2076	E8	2661	C7	3046	B4	3619	A5	4494	B1	7854	D4
2077	E7	2662	D7	3085	E7	3621	B5	4496	C2	7855	D5
2078	D7	2663	C7	3093	F8	3623	B5	4498	E2	7856	E5
2079	E7	2666	D7	3094	F7	3624	A5	4501	A9	7857	D6
2080	E7	2668	E8	3101	B6	3625	B5	4651	A5	7871	E2
2081	E7	2669	E8	3102	A6	3627	B5	4652	A6		
2082	E7	2674	C8	3103	B7	3628	A6	4701	D9		
2083	E7	2675	C8	3104	B6	3629	A5	4702	D9		
2084	E7	2677	C8	3105	B7	3630	B5	4703	D9		
2085	F8	2678	C8	3106	B7	3632	A6	4704	E9		
2086	E7	2682	C8	3107	A7	3633	A6	4705	C9		
2087	E7	2684	C8	3108	A6	3641	A4	4706	D9		
2088	E8	2686	C7	3109	A6	3643	A4	4711	B9		
2089	E8	2687	B7	3110	B7	3644	A4	4712	D9		
2090	F8	2702	D9	3111	B8	3645	A5	4713	A9		
2091	F8	2703	E9	3112	B8	3646	A4	4722	D8		
2092	F8	2704	C9	3113	A7	3647	A5	4723	D8		
2093	E5	2705	C9	3114	A8	3648	A5	4724	C9		
2094	E5	2706	D9	3115	B7	3652	C7	4771	F9		
2095	D5	2707	C9	3116	B7	3655	C7	4772	F9		
2099	F6	2708	D9	3117	B7	3656	C7	4773	E9		
2100	B7	2709	E9	3119	B7	3657	C7	4774	F9		
2101	B7	2710	C9	3120	B7	3658	C7	4851	E5		
2103	B7	2711	B9	3323	D1	3659	A8	4911	A1		
2104	B6	2712	B9	3325	D1	3660	A8	4912	A1		
2105	B7	2714	C9	3332	D1	3661	A8	4914	A1		
2107	A7	2715	C9	3334	D1	3662	A8	4915	E9		
2108	A8	2716	C9	3335	D1	3663	D7	4916	F5		
2109	A6	2718	B9	3337	D1	3701	B9	5455	C2		
2110	A7	2719	A9	3341	A1	3705	D9	5456	B1		
2111	A7	2720	A9	3354	A1	3706	D9	5457	A1		
2112	A7	2721	B9	3359	B1	3707	D9	5603	A5		
2113	A7	2724	A9	3372	A3	3708	C9	5701	B9		
2114	A6	2726	C9	3373	B4	3709	D9	5707	D9		
2115	A7	2727	A9	3374	B3	3710	D9	5772	E9		
2116	A7	2730	D9	3375	D2	3711	E9	5803	F5		
2117	A7	2772	F9	3376	B3	3712	A9	5804	F5		
2118	A7	2773	F9	3378	B4	3713	C9	5805	F4		
2119	A7	2774	F9	3379	A3	3714	A9	5806	F4		
2120	A7	2775	F9	3382	A4	3717	B9	5807	F5		
2122	A7	2777	F9	3385	A4	3719	C9	5872	F2		
2123	B7	2778	F9	3387	A3	3720	C9	6509	A9		
2124	A8	2779	F9	3388	B4	3721	C9	6510	A9		
2126	B7	2780	E9	3390	A4	3724	D9	6701	D9		
2321	D1	2781	F9	3391	B4	3725	D9	6702	D9		
2322	D1	2784	E9	3392	B4	3726	D9	7001	C6		
2401	D2	2801	E6	3393	B3	3728	D9	7002	F4		
2402	D3	2802	E6	3394	B3	3729	D8	7003	C6		
2403	D3	2803	E5	3397	A4	3730	C8	7004	D6		
2404	B3	2805	E6	3398	B5	3731	C8	7005	C5		
2405	B3	2806	E6	3401	B3	3733	A9	7006	C4		
2407	C1	2807	E6	3402	C3	3734	C9	7007	C4		
2408	C1	2808	E6	3403	D3	3735	C9	7008	B4		
2409	C1	2809	E6	3404	B3	3772	F9	7009	C4		
2410	A3	2810	E6	3405	B3	3773	F9	7010	B4		
2411	A2	2811	E6	3406	C3	3774	F9	7011	C4		
2412	B3	2813	F5	3407	D3	3775	F9	7014	E6		
2414	A2	2814	F5	3408	B3	3776	E9	7015	E6		
2451	D2	2815	F5	3409	D3	3801	E6	7016	E6		
2453	C2	2816	E5	3410	D3	3802	E5	7061	E7		
2454	C1	2817	F5	3412	A2	3803	E6	7062	D7		
2455	A2	2818	F5	3415	D1	3809	E6	7063	E8		
2456	C1	2819	F4	3416	C2	3810	E6	7064	E6		
2457	C1	2820	F5	3419	C1	3815	F6	7065	E6		
2458	C1	2821	F5	3422	C3	3819	E6	7067	F7		
2459	A1	2824	F5	3423	B3	3820	E6	7068	F8		
2461	B5	2825	F5	3425	B3	3822	F5	7091	F7		
2463	F7	2826	F5	3427	B3	3823	F5	7092	F7		
2473	B3	2828	E6	3429	C3	3824	F6	7101	B6		
2474	B4	2829	E6	3430	C2	3830	E2	7102	B6		
2476	B3	2830	E2	3435	F3	3831	E2	7103	B7		
2477	A3	2832	E2	3438	C2	3832	E2	7104	A7		
2478	A3	2833	E2	3440	C2	3833	E2	7105	B7		

Motherboard (MOBO)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7
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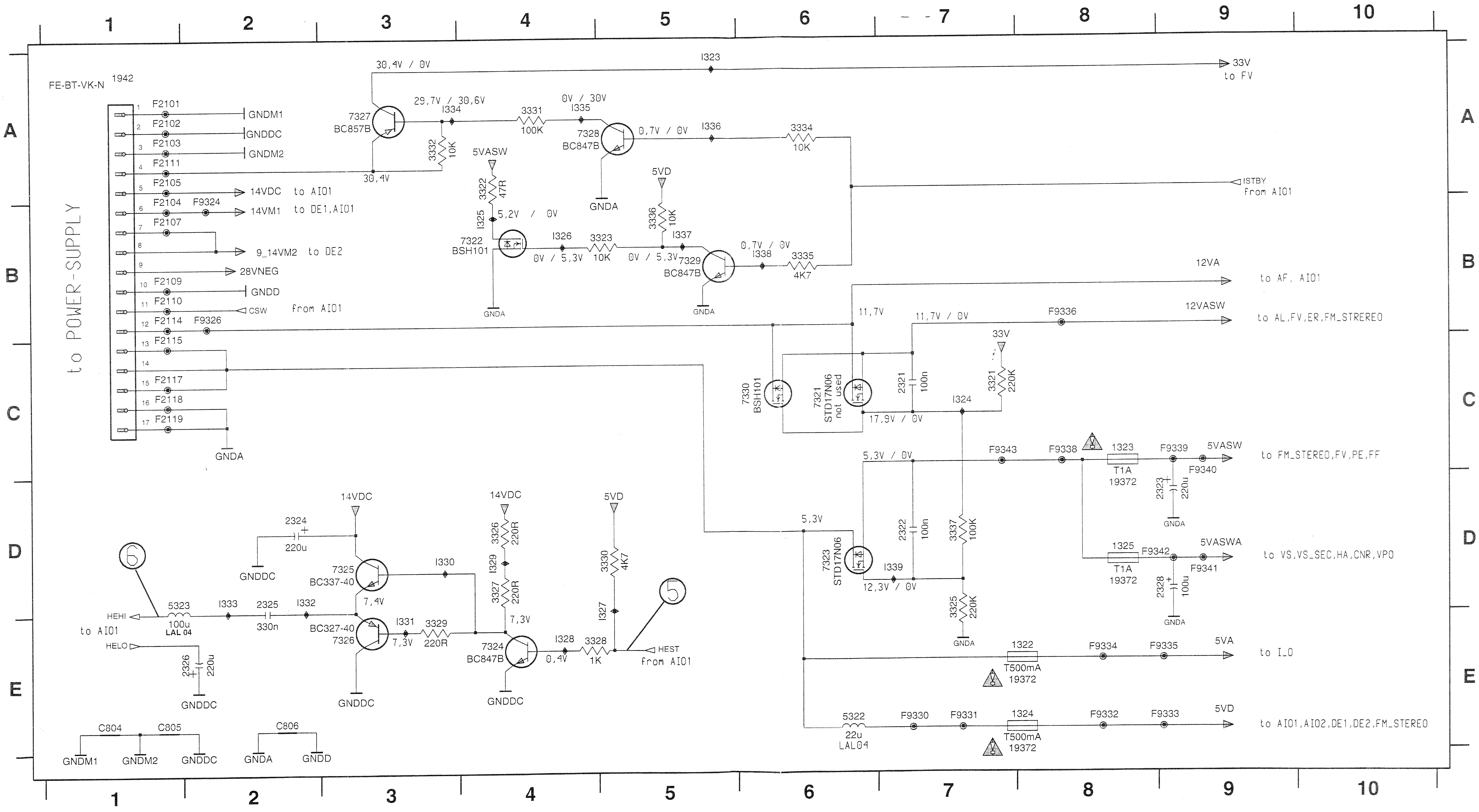
9
A
B
C
D
E
F
7406
121
7005
7651
7705
7708
7771
7871
7851
7857
7091
7104
7106
7103
7401
2045

Supply Part (PS)

Interconnections Manual Page

AF	3-26	AIO2	3-41	CNR	3-36	DE	3-42	FF	3-43	FOME	3-44	HA	3-32	PE	3-40	QNIC	3-46	VS	3-31
AIO1	3-38	AL	3-28	DC	3-48	ER	3-27	FM_STEREO	3-25	FV	3-24	I_O	3-37	PS	3-22	VPO	3-45	VS_SEC	3-35

1323 C8
1324 E8
1325 D8
2321 C7
2322 D7
2323 D9
2325 D2
2326 E2
2328 D9
3322 A4
3323 B5
3325 D7
3327 D4
3328 E4
3329 E3
3331 A4
3332 A3
3334 A6
3336 B5
3337 D7
5322 E6
7321 C6
7322 B4
7323 D6
7325 D3
7326 E3
7327 A3
7329 B5
7330 C6
C804 E1
C806 E2
F2101 A1
F2102 A1
F2104 B1
F2105 A1
F2107 B1
F2110 B1
F2111 A1
F2114 B1
F2117 C1
F2118 C1
F2119 C1
F9326 B2
F9330 E7
F9331 E7
F9333 E9
F9334 E8
F9335 E9
F9338 C8
F9339 C9
F9340 D9
F9342 D8
F9343 C7
I323 A5
I325 B4
I326 B4
I327 D5
I329 D4
I330 D3
I331 E3
I333 D2
I334 A3
I335 A4
I337 B5
I338 B6
I339 D7


1
2
3
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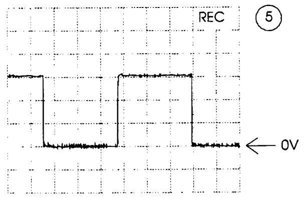
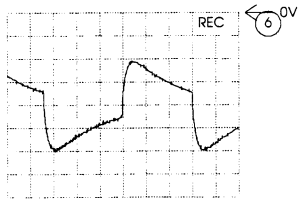
7
8
9
10
A
B
C
D
E
FE-BT-VK-N
1942
to POWER-SUPPLY
F2101
F2102
F2103
F2111
F2105
F2104
F9324
F2107
F2109
F2110
F2114
F9326
F2115
F2117
F2118
F2119
GNDM1
GNDDC
GNDM2
14VDC to AIO1
14VM1 to DE1,AIO1
9_14VM2 to DE2
28VNEG
GNDD
CSW from AIO1
GNDA
30,4V / 0V
30,4V
29,7V / 30,6V
I334
7327
BC857B
3332
10K
3331
100K
0V / 30V
I335
7328
BC847B
0,7V / 0V
I336
3334
10K
GNDA
5VASW
3322
47R
I325
5,2V / 0V
7322
BSH101
I326
3323
10K
0V / 5,3V
5VD
3336
10K
I337
0,7V / 0V
I338
3335
4K7
7329
BC847B
I323
33V to FV
ISTBY from AIO1
12VA
to AF, AIO1
12VASW
to AL,FV,ER,FM_STEREO
11,7V
11,7V / 0V
F9336
33V
7330
BSH101
7321
STD17N06
not used
2321
100n
3321
220K
I324
17,9V / 0V
5,3V / 0V
F9343
F9338
1323
T1A
19372
F9339
F9340
5VASW
to FM_STEREO,FV,PE,FF
2323
220u
5,3V
7323
STD17N06
2322
100n
3337
100K
I339
12,3V / 0V
3325
220K
1325
F9342
T1A
19372
F9341
5VASWA
to VS,VS_SEC,HA,CNR,VPO
2328
100u
1322
T500mA
19372
F9334
F9335
5VA
to I_O
5322
22u
LAL04
F9330
F9331
1324
T500mA
19372
F9332
F9333
5VD
to AIO1,AIO2,DE1,DE2,FM_STEREO
14VDC
2324
220u
GNDDC
7325
BC337-40
I330
7,4V
BC327-40
7326
I331
3329
220R
7,3V
6
HEHI
HELO
to AIO1
5323
100u
LAL 04
I333
2325
330n
I332
2326
220u
3326
220R
I329
3327
220R
7324
BC847B
I328
3328
1K
0,4V
5VD
3330
4K7
I327
5
HEST from AIO1
C804
C805
C806
GNDM1
GNDM2
GNDDC
GNDA
GNDD

Oscillograms Supply Part



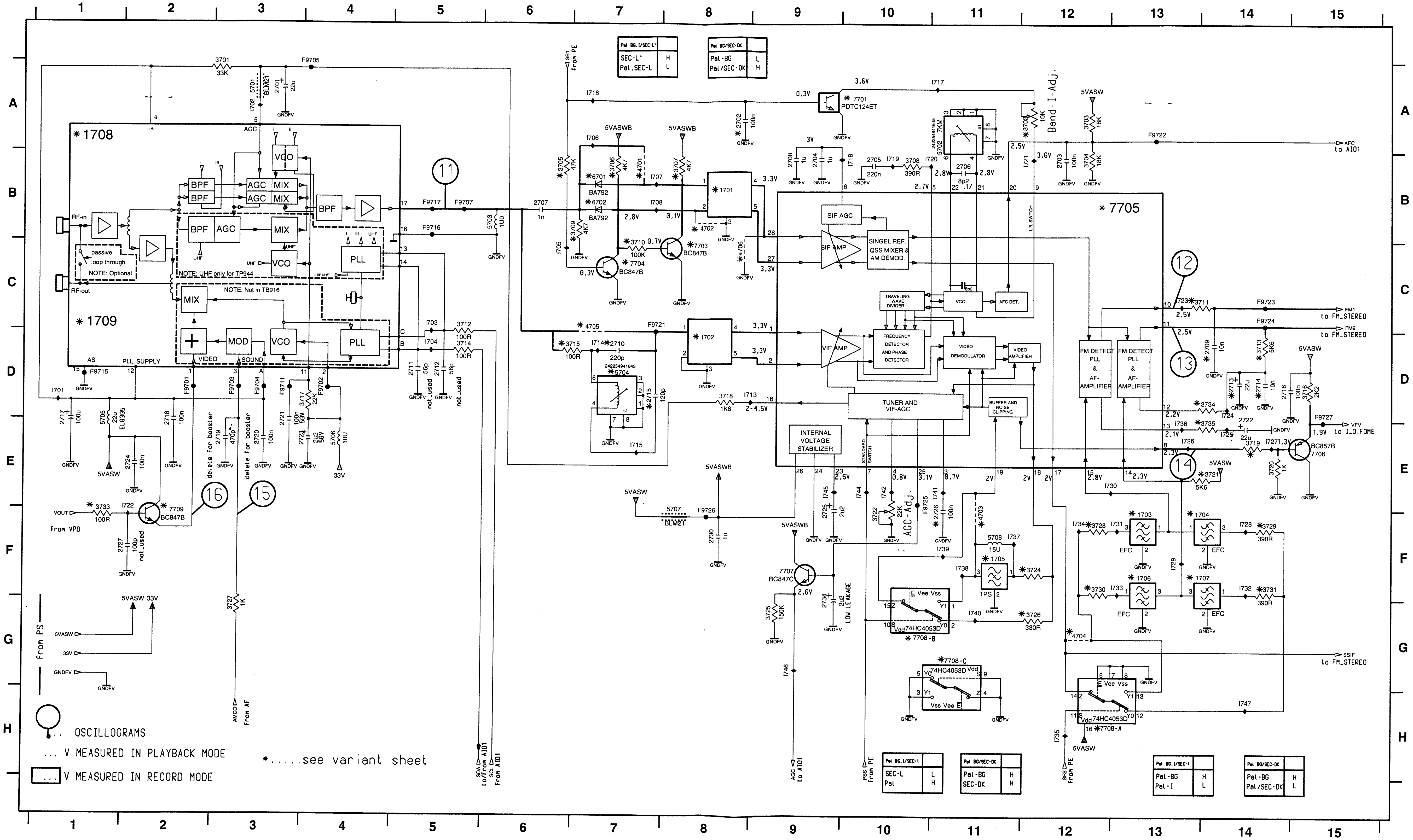
A: DC, 500mV/Div, 5us/Div
Connector 1944 Pin 13

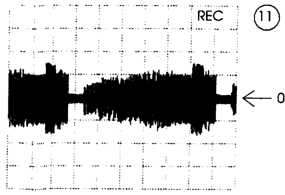


A: DC, 5 V/Div, 5us/Div
Connector 1944 Pin 5

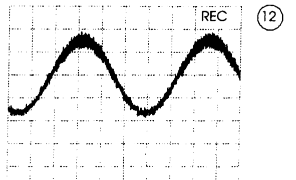
Frontend (FV)

1701	B8
1702	D8
1703	F13
1704	F14
1705	F11
1706	F13
1707	F14
1708	A1
1709	C1
2701	A3
2702	A8
2703	B12
2704	B9
2705	B10
2706	B11
2707	B6
2708	B9
2709	D14
2710	D7
2711	D5
2712	D5
2713	D14
2714	D14
2715	D7
2716	D14
2717	E1
2718	E2
2719	E3
2720	E3
2721	E3
2722	D14
2723	E4
2724	E2
2725	F9
2726	F11
2727	F2
2730	F8
2734	G9
3701	A3
3702	A12
3703	A12
3704	B12
3705	B6
3706	B7
3707	B8
3708	B10
3709	B7
3710	C7
3711	C13
3712	C5
3713	D14
3714	D5
3715	D6
3716	D15
3717	D4
3718	D8
3719	E14
3720	E14
3721	E14
3722	E10
3724	F12
3725	G9
3726	G12
3727	G3
3728	F12
3729	F14
3730	F12
3731	F14
3733	F1
3734	D14
3735	E14
4701	B7
4702	B8
4703	F11
4704	G12
4705	C7
4706	C8
5701	A3
5702	B11
5703	B6
5704	D7
5705	E1
5706	E4
5707	E8
5708	F11
6701	B7
6702	B7
7701	A10
7703	C8
7704	C7
7705	B12
7706	E15
7707	F9
7708	G10
7708	G11
7708	H12
7709	F2
F9701	D2
F9702	D4
F9703	D3
F9704	D3
F9705	A4
F9707	B5
F9711	D3
F9715	D1
F9716	B5
F9717	B5
F9721	C7
F9722	A13
F9723	C14
F9724	C14
F9725	E10
F9726	F8
F9727	D15
I701	D1
I702	A3
I703	C5
I704	D5
I705	C6
I706	A7
I707	B7
I708	B7
I713	D8
I714	D7
I715	E7
I716	A7
I717	A11
I718	B10
I719	B10
I720	B10
I721	B12
I722	E2
I723	C13
I724	D14
I725	E14
I726	E13
I727	E14
I728	F14
I729	F13
I730	E12
I731	F13
I732	F14
I733	F13
I734	F12
I735	H12
I736	E13
I737	F11
I738	F11
I739	F11
I740	G11
I741	E11
I742	E10
I744	E10
I745	E9
I746	G9
I747	H14

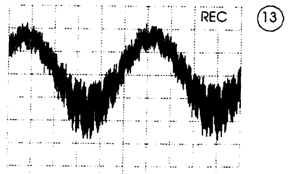

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H
*1708
*1709
RF-in
RF-out
passive loop through
NOTE: Optional
NOTE: UHF only for TP944
NOTE: Not in TB916
BPF
AGC
MIX
VCO
PLL
MOD
VIDEO
SOUND
AS
PLL_SUPPLY
AGC
3701 33K
F9705
5701 BLM21
2701 22u
GNDFV
F9715
I701
2717 100u
5705 22u ELB395
2718
2724 100n
5VASW
2719 470p
2720 100n
2721 100n
2723 2u2
5706 10U
33V
delete for booster
delete for booster
VOUT
From VPO
*3733 100R
I722
*7709 BC847B
2727 100p not_used
F9717
F9707
F9716
5703 1U0
I703
I704
3712 100R
3714 100R
2711 56p not_used
2712 56p not_used
3717 22K
F9701
F9703
F9704
F9711
F9702
3727 1K
AMCO From AF
SDA to/from AI01
SCL from AI01
SB1 from PE
2707 1n
I705
I706
I716
5VASWB
*3705 47K
*6701 BA792
*6702 BA792
*3706 4K7
*4701
*3709 4K7
I707
I708
*3707 4K7
*3710 100K
*7704 BC847B
*7703 BC847B
0.3V
2.8V
0.7V
0.1V
*4702
*4706
*1701
2702 100n
*4705
F9721
*3715 100R
I714
*2710 220p
*5704
2715
120p
I715
*1702
3718 1K8
I713
2-4.5V
3.3V
5VASW
5707 BLM21
F9726
2730 1u
7701 PDTC124ET
3.6V
I717
5702 7KM
2708 1u
2704 1u
I718
2705 220n
I719
3708 390R
I720
2706 8p2
2.8V
2.7V
*7705
SIF AGC
SIF AMP.
SINGEL REF. QSS MIXER & AM DEMOD.
TRAVELING WAVE DIVIDER
VCO
AFC DET.
VIF AMP
FREQUENCY DETECTOR AND PHASE DETECTOR
VIDEO DEMODULATOR
VIDEO AMPLIFIER
TUNER AND VIF-AGC
BUFFER AND NOISE CLIPPING
INTERNAL VOLTAGE STABILIZER
STANDARD SWITCH
L/L SWITCH
Band-I-Adj.
*3702 10K
3703 18K
3704 18K
2703 100n
I721
2.5V
F9722
AFC to AI01
FM DETECT PLL & AF-AMPLIFIER
FM DETECT PLL & AF-AMPLIFIER
*3711
F9723
FM1 to FM_STEREO
F9724
FM2 to FM_STEREO
*2709 10n
*3713 5K6
2713 22u
2714 10n
2716 100n
3716 2K2
*3734
I724
2722
*3735
I725
22u
3719
I727
1.3V
BC857B 7706
3720 1K
*3721 5K6
F9727
VFV to I.O.FONE
2.2V
2.1V
2.3V
2.8V
2.3V
I730
5VASWB
7707 BC847C
2.6V
3725 150K
2734 2u2
LOW LEAKAGE
2725 2u2
I745
I744
3722
I742 22K
AGC-Adj.
F9725
2726
I741 100n
*4703
I739
5708 15U
I737
*1705
TPS
I738
*3724
I740
*3726 330R
*7708-B
74HC4053D
*7708-C
74HC4053D
*7708-A
74HC4053D
Vee Vss
Vdd
I746
AGC to AI01
PSS From PE
SFS From PE
I735
*4704
SSIF to FM_STEREO
I747
*1703
*1704
*1706
*1707
EFC
I734
*3728
I731
I728
*3729 390R
*3730
I733
I732
*3731 390R
I729
I736
I726
I723
Pal BG,I/SEC-L'
SEC-L' H
Pal,SEC-L L
Pal BG/SEC-DK
Pal-BG L
Pal/SEC-DK H
Pal BG,I/SEC-L
SEC-L L
Pal H
Pal BG/SEC-DK
Pal-BG H
SEC-DK H
Pal BG,I/SEC-L
Pal-BG H
Pal-I L
Pal BG/SEC-DK
Pal-BG H
Pal/SEC-DK L
From PS
5VASW 33V
5VASW
33V
GNDFV
OSCILLOGRAMS
... V MEASURED IN PLAYBACK MODE
... V MEASURED IN RECORD MODE
*.....see variant sheet



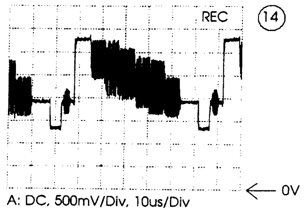
A: DC, 200mV/Div, 10us/Div
Tuner Pin 17



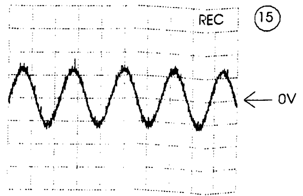
A: DC, 500mV/Div, 200us/Div
IC 7705 Pin 10



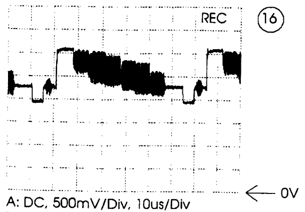
A: DC, 500mV/Div, 200us/Div
IC 7705 Pin 11



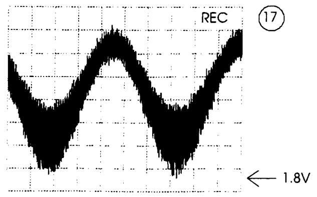
A: DC, 500mV/Div, 10us/Div
IC 7705 Pin 8



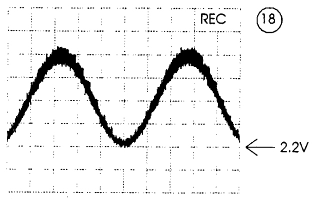
A: DC, 500mV/Div, 500us/Div
Tumod Pin 3



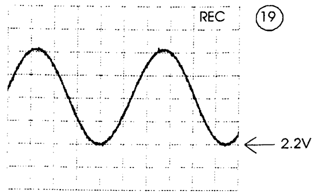
A: DC, 500mV/Div, 10us/Div
Tumod Pin 1



A: AC, 200mV/Div, 200us/Div
IC 7771 Pin 8



A: AC, 200mV/Div, 200us/Div
IC 7771 Pin 7



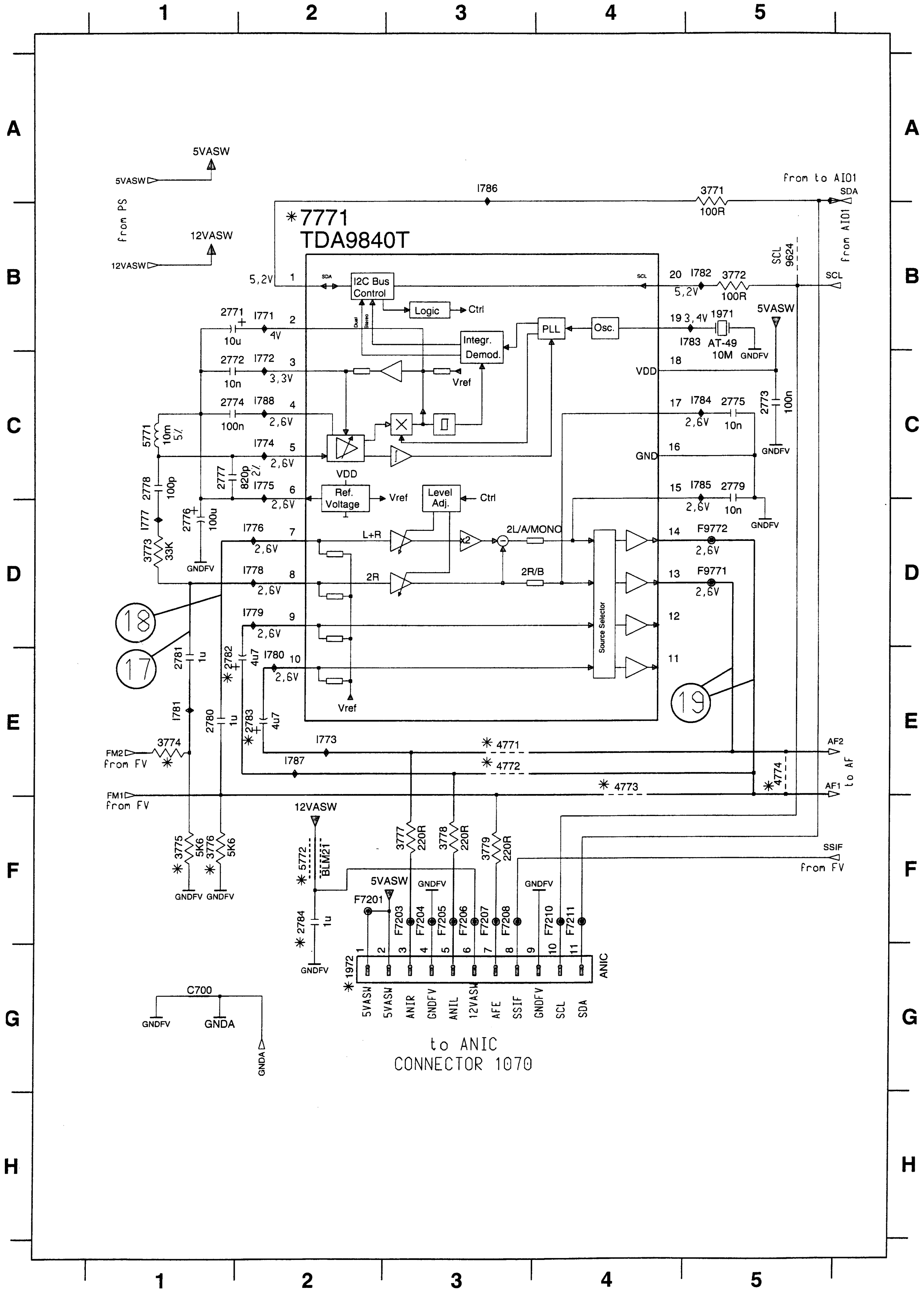
A: AC, 200mV/Div, 200us/Div
IC 7771 Pin 13/14

PCS 93930

Stereo Decoder (FM_STEREO)

Interconnections Manual Page

AF 3-26	AIO2 3-41	CNR 3-36	DE 3-42	FF 3-43	FOME 3-44	HA 3-32	PE 3-40	QNIC 3-46	VS 3-31
AIO1 3-38	AL 3-28	DC 3-48	ER 3-27	FM_STEREO 3-25	FV 3-24	I_O 3-37	PS 3-22	VPO 3-45	VS_SEC 3-35



1
2
3
4
5
A
B
C
D
E
F
G
H
5VASW
12VASW
from PS
from to AIO1
SDA
SCL
from AIO1
*7771
TDA9840T
I786
3771
100R
I2C Bus Control
Logic
Ctrl
Integr. Demod.
PLL
Osc.
Vref
VDD
GND
Ref. Voltage
Level Adj.
L+R
2R
2L/A/MONO
2R/B
Source Selector
5,2V
4V
3,3V
2,6V
2771
10u
2772
10n
2774
100n
I771
I772
I788
I774
I775
I776
I778
I779
I780
5771
10m
2778
100p
2777
820p
2776
100u
I777
3773
33K
GNDFV
20 I782 3772
100R
19 3,4V 1971
I783 AT-49
18 10M
17 I784 2775
10n
2773
100n
16
15 I785 2779
14 F9772
13 F9771
12
11
SCL 9624
18
17
19
2781
1u
2782
4u7
2783
4u7
2780
1u
I781
3774
FM2
from FV
FM1
from FV
I773
I787
*4771
*4772
*4773
*4774
AF2
AF1
to AF
12VASW
5772
BLM21
2784
1u
3775
5K6
3776
5K6
3777
220R
3778
220R
3779
220R
5VASW
F7201
F7203
F7204
F7205
F7206
F7207
F7208
F7210
F7211
SSIF
from FV
1972
ANIC
5VASW
5VASW
ANIR
GNDFV
ANIL
12VASW
AFE
SSIF
GNDFV
SCL
SDA
to ANIC
CONNECTOR 1070
C700
GNDA

1971	B5
1972	G2
2771	B1
2772	C1
2773	C5
2774	C1
2775	C5
2776	D1
2777	C1
2778	C1
2779	C5
2780	E1
2781	E1
2782	E1
2783	E2
2784	F2
3771	A5
3772	B5
3773	D1
3774	E1
3775	F1
3776	F1
3777	F3
3778	F3
3779	F3
4771	E3
4772	E3
4773	E4
4774	E5
5771	C1
5772	F2
7771	B2
9624	B5
C700	G1
F7201	F2
F7203	F3
F7204	F3
F7205	F3
F7206	F3
F7207	F3
F7208	F3
F7210	F4
F7211	F4
F9771	D5
F9772	D5
I771	B2
I772	C2
I773	E2
I774	C2
I775	C2
I776	D2
I777	D1
I778	D2
I779	D2
I780	E2
I781	E1
I782	B5
I783	B5
I784	C5
I785	C5
I786	A3
I787	E2
I788	C2

Variant List Frontend

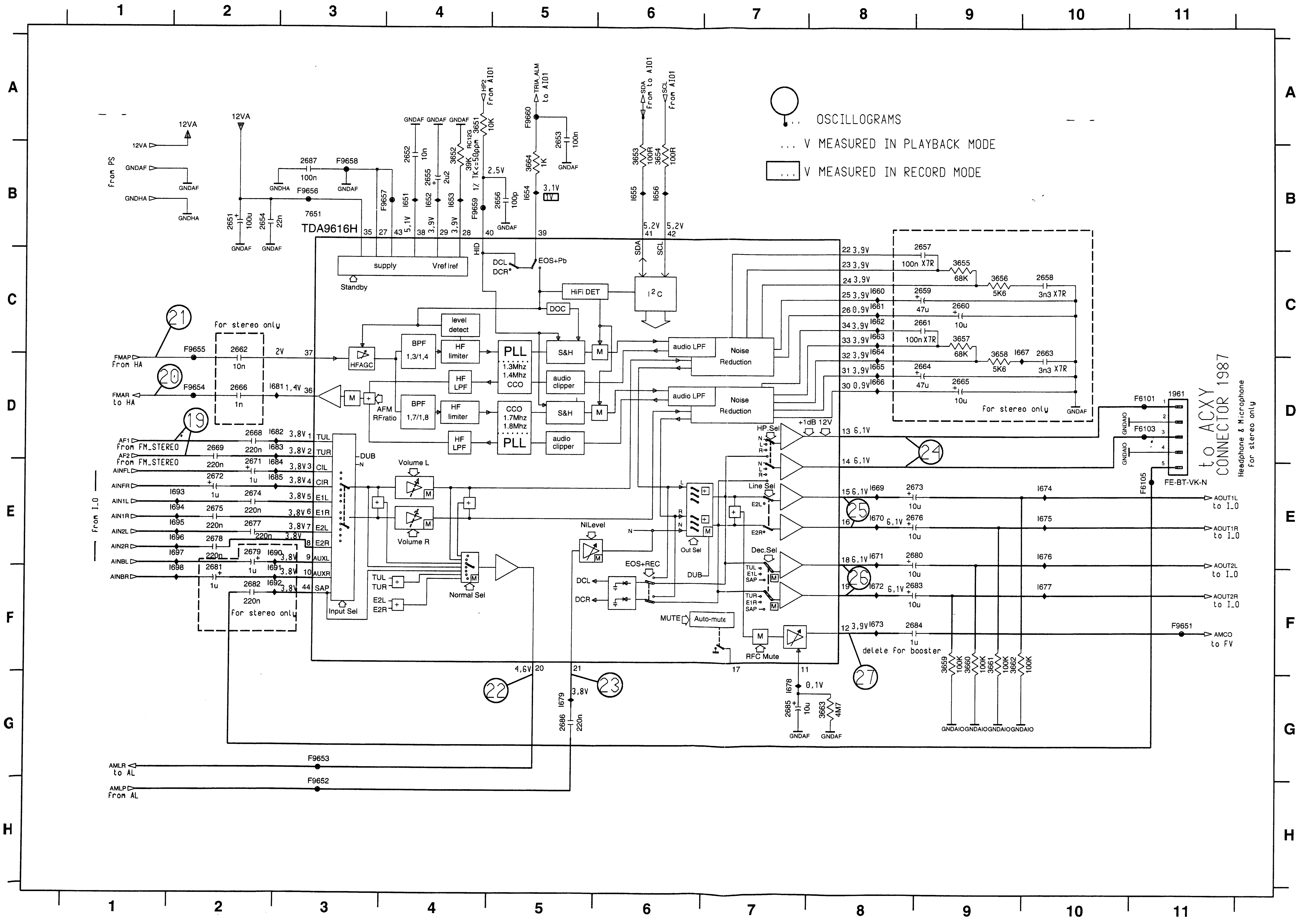
	PAL BG	PAL BG	PAL I FULLBAND	PAL I FULLBAND	PAL, BG,I SEC L L'	PAL, BG,I SEC L L'	PAL,SEC, BG/DK	PAL,SEC, BG/DK	K1
Pos.	FM/NICAM Stereo	MONO Interc.	NICAM Stereo	MONO Interc.	FM/NICAM Stereo	MONO	FM/NICAM Stereo	MONO	MONO
1701	G9353M	-	K9463M	-	K9456M	K9456M	K9463M	K9463M	L9360M
1702	G3956M	G1961M	K3953M	J1980M	K3953M	G1965M	G3956M	G3956M	G3956M
1703	EFC 5,5	EFC 5,5	EFC 6,0	EFC 6,0	EFC 5,5	EFC 5,5	EFC 5,5	EFC 5,5	EFC 6,5
1704	-	-	-	-	EFC 6,0	EFC 6,0	EFC 6,5	EFC 6,5	-
1705	TPS 5,5	TPS5,5	TPS6,0	TPS6,0	TPS 5,5	TPS 5,5	TPS 5,5	TPS 5,5	TPS 6,5
1706	EFC 5,74	-	-	-	EFC 5,74	-	EFC 5,74	-	-
1707	-	-	-	-	-	-	EFC 6,25	-	-
2702	-	-	-	-	100n	100n	-	-	-
2707	1n	-	1n	-	1n	1n	1n	1n	1n
2709	-	10n	10n	10n	-	-	-	10n	10n
2710	-	-	-	-	220p	220p	-	-	-
2713	22u	-	-	-	22u	-	22u	-	-
2714	-	-	-	-	-	10n	-	-	-
2715	-	-	-	-	120p	120p	-	-	-
2724	not used	-	-	-	not used	-	not used	-	-
2726	-	-	-	-	100n	100n	-	-	-
3702	-	-	-	-	10k	10k	-	-	-
3705	-	-	-	-	47k	47k	47k	47k	-
3706	-	-	-	-	4k7	4k7	4k7	4k7	-
3707	-	-	-	-	4k7	4k7	4k7	4k7	-
3709	-	-	-	-	4k7	4k7	4k7	4k7	-
3710	-	-	-	-	100k	100k	100k	100k	-
3711	4k7	5k6	5k6	5k6	4k7	0E	0E	5k6	4k7
3713	-	-	-	-	-	5k6	-	-	-
3715	-	-	-	-	100E	100E	-	-	-
3719	1k	1k	820E	820E	820E	820E	820E	820E	1k
3721	5k6	-	-	-	5k6	-	5k6	-	-
3724	330E	330E	330E	330E	270E	270E	330E	330E	330E
3726	-	-	-	-	330E	330E	-	-	-
3728	470E	470E	470E	470E	390E	390E	390E	390E	470E
3729	-	-	-	-	390E	390E	390E	390E	-
3730	470E	-	-	-	390E	-	390E	-	-
3731	-	-	-	-	-	-	390E	-	-
3734	0E	-	-	-	0E	-	470E	-	-
3735	0E	0E	0E	0E	0E	0E	470E	0E	0E
4701	0E	-	0E	-	-	-	-	-	0E
4702	0E	-	0E	-	-	-	-	-	0E
4703	0E	0E	0E	0E	-	-	-	-	0E
4704	0E	0E	0E	0E	-	-	-	-	0E
4705	0E	0E	0E	0E	-	-	0E	0E	0E
4706	-	0E	-	0E	-	-	-	-	-
5704	-	-	-	-	41645	41645	-	-	-
6701	-	-	-	-	BA 792	BA 792	BA 792	BA 792	-
6702	-	-	-	-	BA 792	BA 792	BA 792	BA 792	-
7701	-	-	-	-	PDTC124	PDTC124	-	-	-
1708	TP916L MKII	TP916L MKII	-	-	TP926L MKII	TP926L MKII	-	-	-
1709	TMRG 1-107A	TMRG 1-107A	TMRG 1-109A	TMRG 1-109A	TMRG 2-103A	TMRG 2-103A	TMRG 1X204A	TMRG 1X204A	TMRG 1X204A
7703	-	-	-	-	BC847B	BC847B	BC847B	BC847B	-
7704	-	-	-	-	BC847B	BC847B	BC847B	BC847B	-
7705	TDA 9813T	TDA 9813T	TDA 9813T	TDA 9813T	TDA 9814T	TDA 9812T	TDA 9813T	TDA 9813T	TDA 9813T
7708	-	-	-	-	74HCT4053	74HCT4053	74HCT4053	74HCT4053	-

DELETE FOR BOOSTER: 2719, 2720, 3732, 3733, 7709.

Variant List Stereo Decoder

	PAL BG	PAL BG	PAL BG	PAL I fullband	PAL I fullband	PAL, BG,I SEC L L'	PAL BG,I SEC L L'	PAL,SEC, BG/DK	PAL,SEC, BG/DK	PAL,SEC, BG/DK	K1
Pos.	FM Stereo	FM/NICAM Stereo	MONO	MONO	NICAM Stereo	FM/NICAM Stereo	MONO	FM- Stereo	FM/NICAM Stereo	MONO	NO NO
2782	-	4u7	-	-	-	4u7	-	-	4u7	-	–
2783	-	4u7	-	-	-	4u7	-	-	4u7	-	–
2784	-	1u	-	-	1u	1u	-	-	1u	-	–
3774	4k7	4k7	-	-	-	4k7	-	0E	0E	-	–
3775	5k6	5k6	-	-	-	5k6	-	-	-	-	–
3776	5k6	5k6	-	-	-	5k6	-	-	-	-	–
4771	-	-	-	-	0E	-	-	-	-	-	–
4772	-	-	-	-	0E	-	-	-	-	-	–
4773	-	-	0E	0E	-	-	0E	-	-	0E	0E
5772	-	BML21	-	-	BML21	BML21	-	-	BML21	-	–
7771	TDA 9840 T	TDA 9840 T	-	-	-	TDA 9840 T	-	TDA 9840 T	TDA 9840 T	-	–
1972	-	ANIC (QNIC)	-	-	ANIC (QNIC)	ANIC (QNIC)	-	-	ANIC (QNIC)	-	–

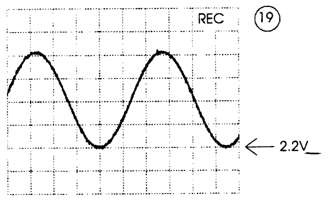
FM Audio (AF)


OSCILLOGRAMS
... V MEASURED IN PLAYBACK MODE
... V MEASURED IN RECORD MODE
7651
TDA9616H
supply
Vref Iref
Standby
12VA
GNDAF
GNDHA
From PS
FMAP From HA
FMAR to HA
for stereo only
AF1 From FM_STEREO
AF2 From FM_STEREO
AINFL
AINFR
AIN1L
AIN1R
AIN2L
AIN2R
AINBL
AINBR
From I_O
HFAGC
BPF 1,3/1,4
BPF 1,7/1,8
HF limiter
HF LPF
PLL
1.3Mhz 1.4Mhz CCO
CCO 1.7Mhz 1.8Mhz
level detect
AFM RFratio
S&H
audio clipper
HiFi DET
DOC
I²C
SDA From to AI01
SCL From AI01
HP2 From AI01
TRIA_ALM to AI01
DCL
DCR
EOS+Pb
audio LPF
Noise Reduction
Input Sel
Volume L
Volume R
Normal Sel
TUL
TUR
E2L
E2R
DUB
NlLevel
EOS+REC
Out Sel
Line Sel
HP.Sel
Dec.Sel
+1dB 12V
MUTE
Auto-mute
RFC Mute
delete for booster
AOUT1L to I_O
AOUT1R to I_O
AOUT2L to I_O
AOUT2R to I_O
AMCO to FV
AMLR to AL
AMLP From AL
F6101
F6103
F6105
1961
FE-BT-VK-N
to ACXY CONNECTOR 1987
Headphone & Microphone For stereo only
GNDAIO
21
20
19
22
23
24
25
26
27

1961	D11
2651	B2
2652	B4
2653	A5
2654	B2
2655	B4
2656	B5
2657	B9
2658	C10
2659	C9
2660	C9
2661	C9
2662	C2
2663	C10
2664	D9
2665	D9
2666	D2
2668	D2
2669	D2
2671	E2
2672	E2
2673	E8
2674	E2
2675	E2
2676	E8
2677	E2
2678	E2
2679	E2
2680	E8
2681	F2
2682	F2
2683	F8
2684	F8
2685	G7
2686	G5
2687	B3
3651	A4
3652	B4
3653	B6
3654	B6
3655	C9
3656	C9
3657	C9
3658	C9
3659	F9
3660	F9
3661	F9
3662	F9
3663	G8
3664	B5
7651	B3
F6101	D11
F6103	D11
F6105	E11
F9651	F11
F9652	H3
F9653	G3
F9654	D2
F9655	C2
F9656	B3
F9657	B4
F9658	B3
F9659	B4
F9660	A5
I651	B4
I652	B4
I653	B4
I654	B5
I655	B6
I656	B6
I660	C8
I661	C8
I662	C8
I663	C8
I664	C8
I665	D8
I666	D8
I667	C9
I669	E8
I670	E8
I671	E8
I672	F8
I673	F8
I674	E10
I675	E10
I676	E10
I677	F10
I678	G7
I679	G5
I681	D2
I682	D2
I683	D2
I684	E2
I685	E2
I690	E2
I691	F2
I692	F2
I693	E2
I694	E2
I695	E2
I696	E2
I697	E2
I698	F2

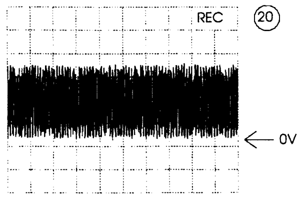
Oscillograms FM Audio, Erase Oscillator

⑲



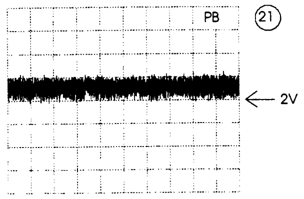
A: AC, 200mV/Div, 200us/Div
IC 7771 Pin 13/14

⑳



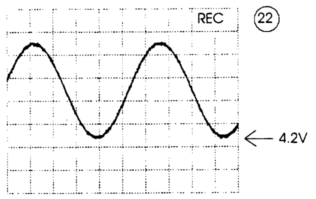
A: DC, 200mV/Div, 5ms/Div
FMAR

㉑



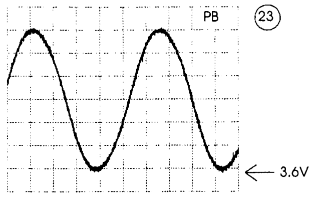
A: AC, 200mV/Div, 500us/Div
FMAP

㉒



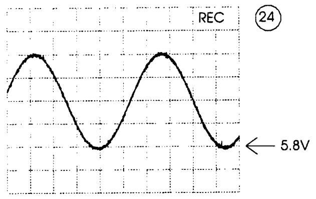
A: AC, 200mV/Div, 200us/Div
IC 7651 Pin 20

㉓



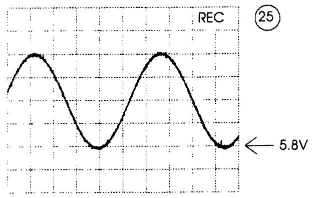
A: AC, 100mV/Div, 200us/Div
IC 7651 Pin 21

㉔



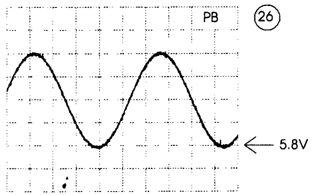
A: AC, 200mV/Div, 200us/Div
IC 7651 Pin 13/14

㉕



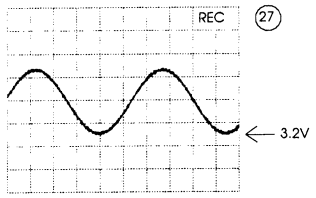
A: AC, 200mV/Div, 200us/Div
IC 7651 Pin 15/16

㉖



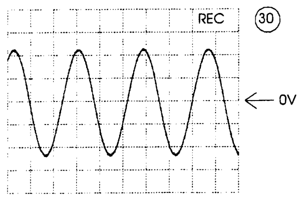
A: AC, 200mV/Div, 200us/Div
IC 7651 Pin 18/19

㉗



A: AC, 500mV/Div, 200us/Div
IC 7651 Pin 12

㉚



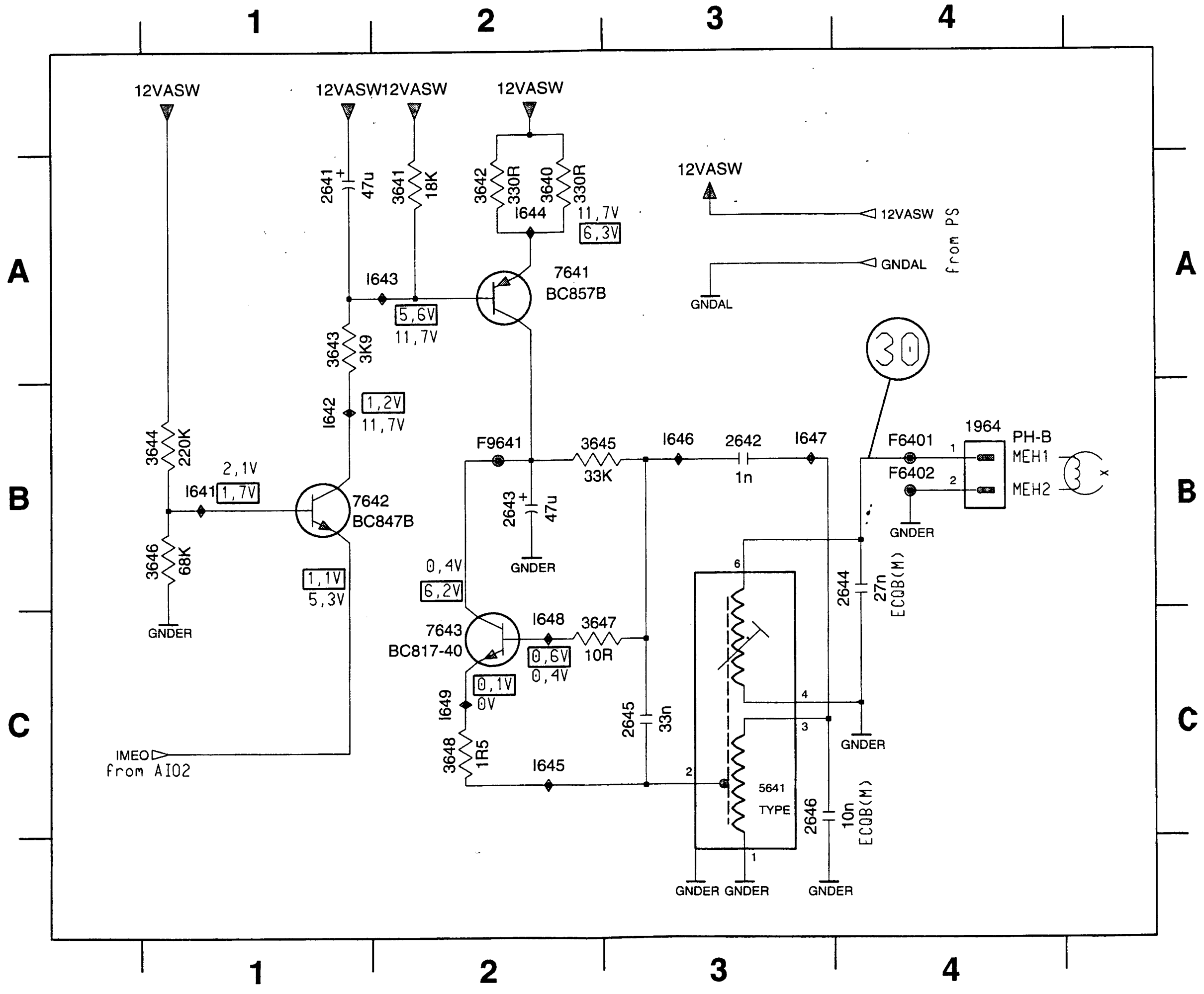
A: DC, 10 V/Div, 5us/Div
Connector 1964 Pin 1

Interconnections Manual Page

AF	3-26	AIO2	3-41	CNR	3-36	DE	3-42	FF	3-43	FOME	3-44	HA	3-32	PE	3-40	QNIC	3-46	VS	3-31
AIO1	3-38	AL	3-28	DC	3-48	ER	3-27	FM_STEREO	3-25	FV	3-24	I_O	3-37	PS	3-22	VPO	3-45	VS_SEC	3-35

Main Erase Oscillator (ER)

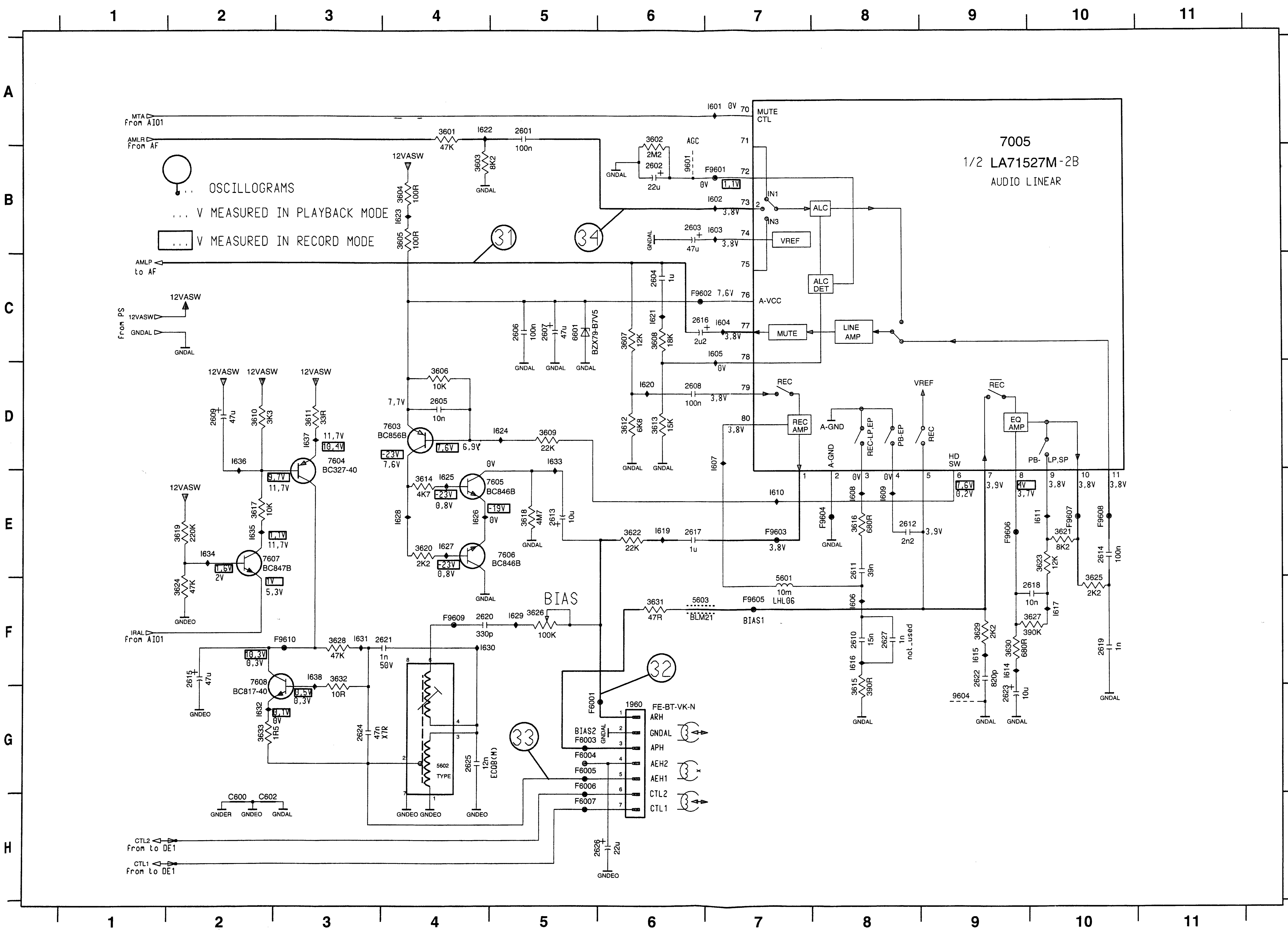
1964 B4	2643 B2	2646 C3	3642 A2	3645 B2	3648 C2	7642 B1	F6402 B4	I642 B1	I645 C2	I648 C2
2641 A1	2644 B4	3640 A2	3643 A1	3646 B1	5641 C3	7643 C2	F9641 B2	I643 A2	I646 B3	I649 C2
2642 B3	2645 C3	3641 A2	3644 B1	3647 C2	7641 A2	F6401 B4	I641 B1	I644 A2	I647 B3	


1
2
3
4
A
B
C
12VASW
12VASW12VASW
12VASW
2641
47u
3641
18K
3642
330R
3640
330R
I644
11,7V
6,3V
12VASW
12VASW
from PS
GNDAL
GNDAL
I643
5,6V
11,7V
7641
BC857B
3643
3K9
I642
1,2V
11,7V
30
3644
220K
2,1V
I641
1,7V
7642
BC847B
3646
68K
GNDER
1,1V
5,3V
F9641
3645
33K
I646
2642
1n
I647
F6401
F6402
1964
PH-B
MEH1
MEH2
2643
47u
GNDER
0,4V
6,2V
7643
BC817-40
I648
3647
0,6V
10R
0,4V
0,1V
0V
I649
3648
1R5
I645
2645
33n
2644
27n
ECOB(M)
5641
TYPE
2646
10n
ECOB(M)
IMEO
from AI02
GNDER
GNDER
GNDER
GNDER

Audio Linear (AL)

Interconnections Manual Page

AF 3-26	AIO2 3-41	CNR 3-36	DE 3-42	FF 3-43	FOME 3-44	HA 3-32	PE 3-40	QNIC 3-46	VS 3-31
AIO1 3-38	AL 3-28	DC 3-48	ER 3-27	FM_STEREO 3-25	FV 3-24	I_O 3-37	PS 3-22	VPO 3-45	VS_SEC 3-35



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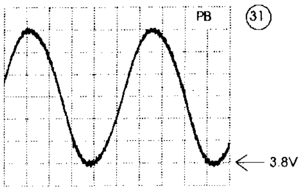
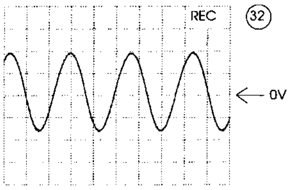
11
A
B
C
D
E
F
G
H
7005
1/2 LA71527M-2B
AUDIO LINEAR
OSCILLOGRAMS
... V MEASURED IN PLAYBACK MODE
... V MEASURED IN RECORD MODE
MTA From AIO1
AMLR From AF
AMLP to AF
12VASW
From PS
GNDAL
IRAL From AIO1
CTL2 From to DE1
CTL1 From to DE1
MUTE CTL
AGC
IN1
IN3
ALC
VREF
ALC DET
A-VCC
MUTE
LINE AMP
REC
REC AMP
A-GND
REC-LP,EP
PB-EP
HD SW
EQ AMP
PB-
LP,SP
BIAS
BIAS1
BIAS2
FE-BT-VK-N
ARH
APH
AEH2
AEH1
CTL2
CTL1
1960
5602 TYPE
7603 BC856B
7604 BC327-40
7605 BC846B
7606 BC846B
7607 BC847B
7608 BC817-40
BZX79-B7V5
BLM21
LHL06
ECOB(M)
X7R
not_used
GNDAL
GNDEO
GNDER
C600
C602
31
32
33
34

1960	G6
2601	A5
2602	B6
2603	B6
2604	C6
2605	D4
2606	C5
2607	C5
2608	D6
2609	D2
2610	F8
2611	E8
2612	E8
2613	E5
2614	E10
2615	F2
2616	C6
2617	E6
2618	F10
2619	F10
2620	F4
2621	F4
2622	F9
2623	G9
2624	G3
2625	G4
2626	H6
2627	F8
3601	A4
3602	A6
3603	B4
3604	B4
3605	B4
3606	D4
3607	C6
3608	C6
3609	D5
3610	D2
3611	D3
3612	D6
3613	D6
3614	E4
3615	G8
3616	E8
3617	E2
3618	E5
3619	E2
3620	E4
3621	E10
3622	E6
3623	E10
3624	F2
3625	F10
3626	F5
3627	F10
3628	F3
3629	F9
3630	F9
3631	F6
3632	F3
3633	G2
5601	F7
5602	G4
5603	F6
6601	C5
7005	B9
7603	D4
7604	D3
7605	E4
7606	E5
7607	E2
7608	F2
9601	B6
9604	G9
C600	H2
C602	H2
F6001	G5
F6003	G5
F6004	G5
F6005	G5
F6006	G5
F6007	H5
F9601	B7
F9602	C6
F9603	E7
F9604	E8
F9605	F7
F9606	E9
F9607	E10
F9608	E10
F9609	F4
F9610	F3
I601	A7
I602	B7
I603	B7
I604	C7
I605	C7
I606	F8
I607	D7
I608	E8
I609	E8
I610	E7
I611	E10
I614	F9
I615	F9
I616	F8
I617	F10
I619	E6
I620	D6
~~I621~~	~~C6~~
I622	A4
I623	B4
I624	D5
I625	E4
I626	E4
I627	E4
I628	E4
I629	F5
I630	F4
I631	F3
I632	G2
I633	D5
I634	E2
I635	E2
I636	D2
I637	D3
I638	F3

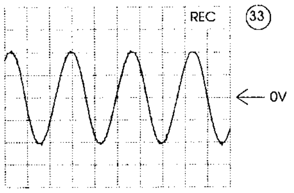
Oscillograms Audio Linear



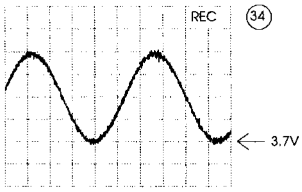
A: AC, 100mV/Div, 200us/Div
IC 7005 Pin 77



A: DC, 20 V/Div, 5us/Div
Connector 1960 Pin 1

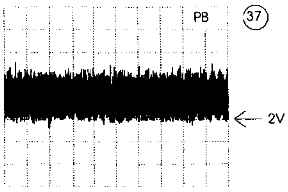


A: DC, 5 V/Div, 5us/Div
Connector 1960 Pin 5

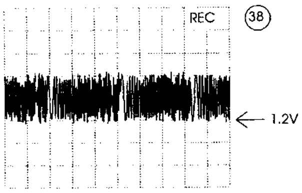


A: AC, 50mV/Div, 200us/Div
IC 7005 Pin 73

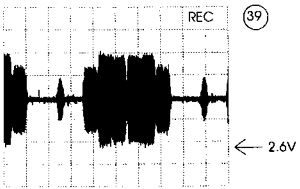
Oscillograms Video Signal Processing



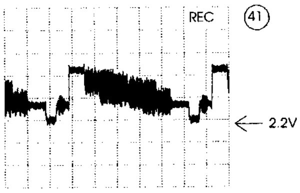
A: AC, 200mV/Div, 20us/Div
IC 7103 Pin 15



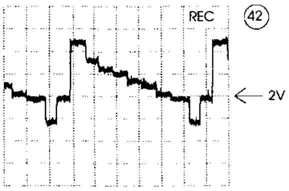
A: AC, 200mV/Div, 20us/Div
FMRV



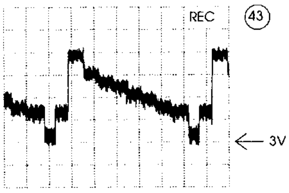
A: AC, 100mV/Div, 10us/Div
CPRV



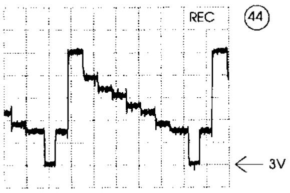
A: AC, 500mV/Div, 10us/Div
IC 7005 Pin 35



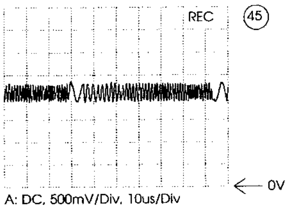
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 42



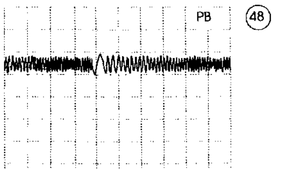
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 40



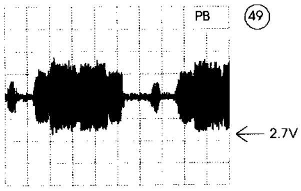
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 26



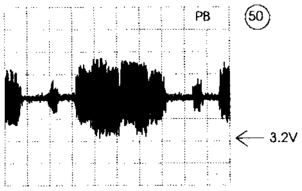
A: DC, 500mV/Div, 10us/Div
IC 7005 Pin 18



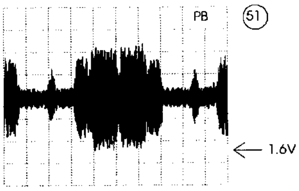
A: DC, 500mV/Div, 10us/Div
IC 7005 Pin 20



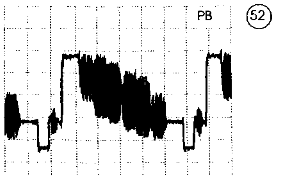
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 48/50



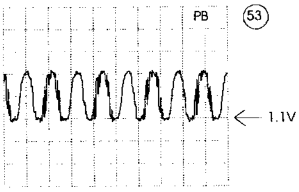
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 52



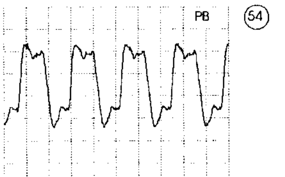
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 45



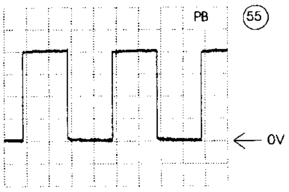
A: DC, 500mV/Div, 10us/Div
IC 7005 Pin 35



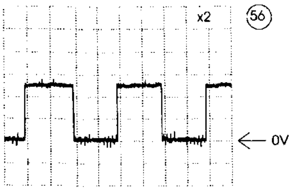
A: AC, 200mV/Div, 100ns/Div
IC 7005 Pin 58



A: DC, 200mV/Div, 100ns/Div
IC 7003 Pin 10



A: DC, 200mV/Div, 10ms/Div
IC 7005 Pin 66

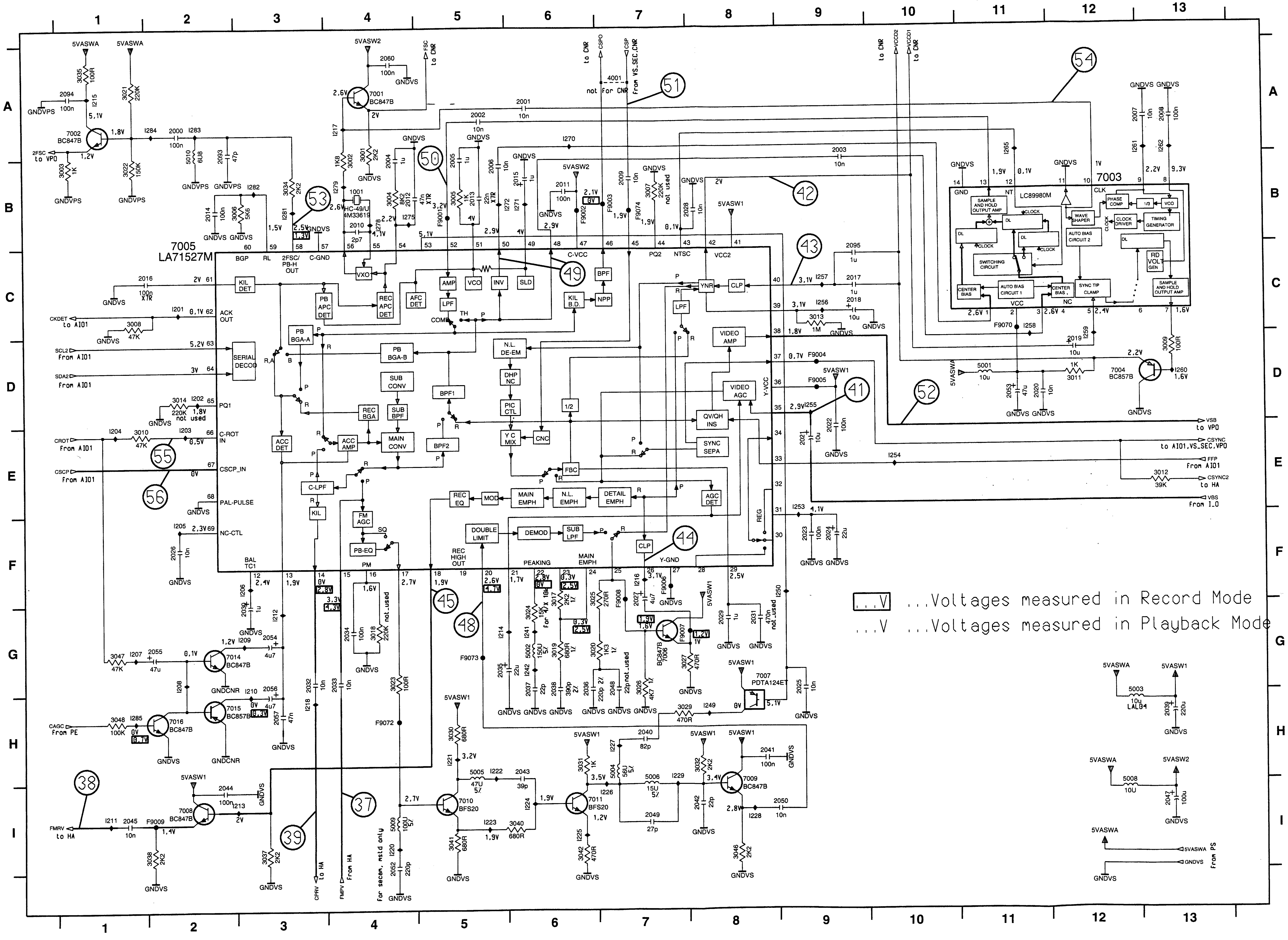


A: DC, 500mV/Div, 10ms/Div
IC 7005 Pin 67

Video Signal Processing (VS)

Interconnections Manual Page

AF	3-26	AIO2	3-41	CNR	3-36	DE	3-42	FF	3-43	FOME	3-44	HA	3-32	PE	3-40	QNIC	3-46	VS	3-31
AIO1	3-38	AL	3-28	DC	3-48	ER	3-27	FM_STEREO	3-25	FV	3-24	I_O	3-37	PS	3-22	VPO	3-45	VS_SEC	3-35



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D
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F
G
H
I
5VASWA
5VASW2
5VASW1
GNDVPS
GNDVS
GNDCNR
2FSC to VPO
to CNR
CSPO
CSP From VS_SEC,CNR
not for CNR
VCCD2
VCCD1
7001 BC847B
7002 BC847B
7003 LC89980M
7004 BC857B
7005 LA71527M
7006 BC847B
7007 PDTA124ET
7008 BC847B
7009 BC847B
7010 BFS20
7011 BFS20
7014 BC847B
7015 BC857B
7016 BC847B
1001 HC-49/U 4M33619
BGP
RL
2FSC/ PB-H OUT
C-GND
C-VCC
PQ2
NTSC
VCC2
KIL DET
ACK OUT
SERIAL DECOD
PQ1
C-ROT IN
CSCP_IN
PAL-PULSE
NC-CTL
BAL TC1
PB APC DET
REC APC DET
AFC DET
VXO
AMP
VCO
INV
SLD
LPF
COMB
TH
KIL B.D.
NPP
BPF
YNR
CLP
VIDEO AMP
VIDEO AGC
QV/QH INS
SYNC SEPA
PB BGA-A
PB BGA-B
N.L. DE-EM
DHP NC
PIC CTL
Y C MIX
CNC
FBC
1/2
SUB CONV
REC BGA
SUB BPF
MAIN CONV
ACC DET
ACC AMP
BPF1
BPF2
C-LPF
KIL
FM AGC
PB-EQ
REC EQ
MOD
MAIN EMPH
N.L. EMPH
DETAIL EMPH
AGC DET
REG
DOUBLE LIMIT
DEMOD
SUB LPF
CLP
Y-GND
Y-VCC
REC HIGH OUT
PEAKING
MAIN EMPH
PM
SQ
GND
NT
CLK
SAMPLE AND HOLD OUTPUT AMP
WAVE SHAPER
PHASE COMP
1/3
VCO
CLOCK DRIVER
TIMING GENERATOR
AUTO BIAS CIRCUIT 2
DL
CLOCK
SWITCHING CIRCUIT
RD VOL GEN
CENTER BIAS
AUTO BIAS CIRCUIT 1
CENTER BIAS
SYNC TIP CLAMP
VCC
NC
CKDET to AIO1
SCL2 From AIO1
SDA2 From AIO1
CROT From AIO1
CSCP From AIO1
CAGC From PE
FMRV to HA
CPRV to HA
FMPV From HA
VSB to VPO
CSYNC to AIO1,VS_SEC,VPO
FFP From AIO1
CSYNC2 to HA
VBS From I_O
5VASWA
GNDVS From PS
For secam, mstd only
(37)
(38)
(39)
(41)
(42)
(43)
(44)
(45)
(48)
(49)
(50)
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(56)

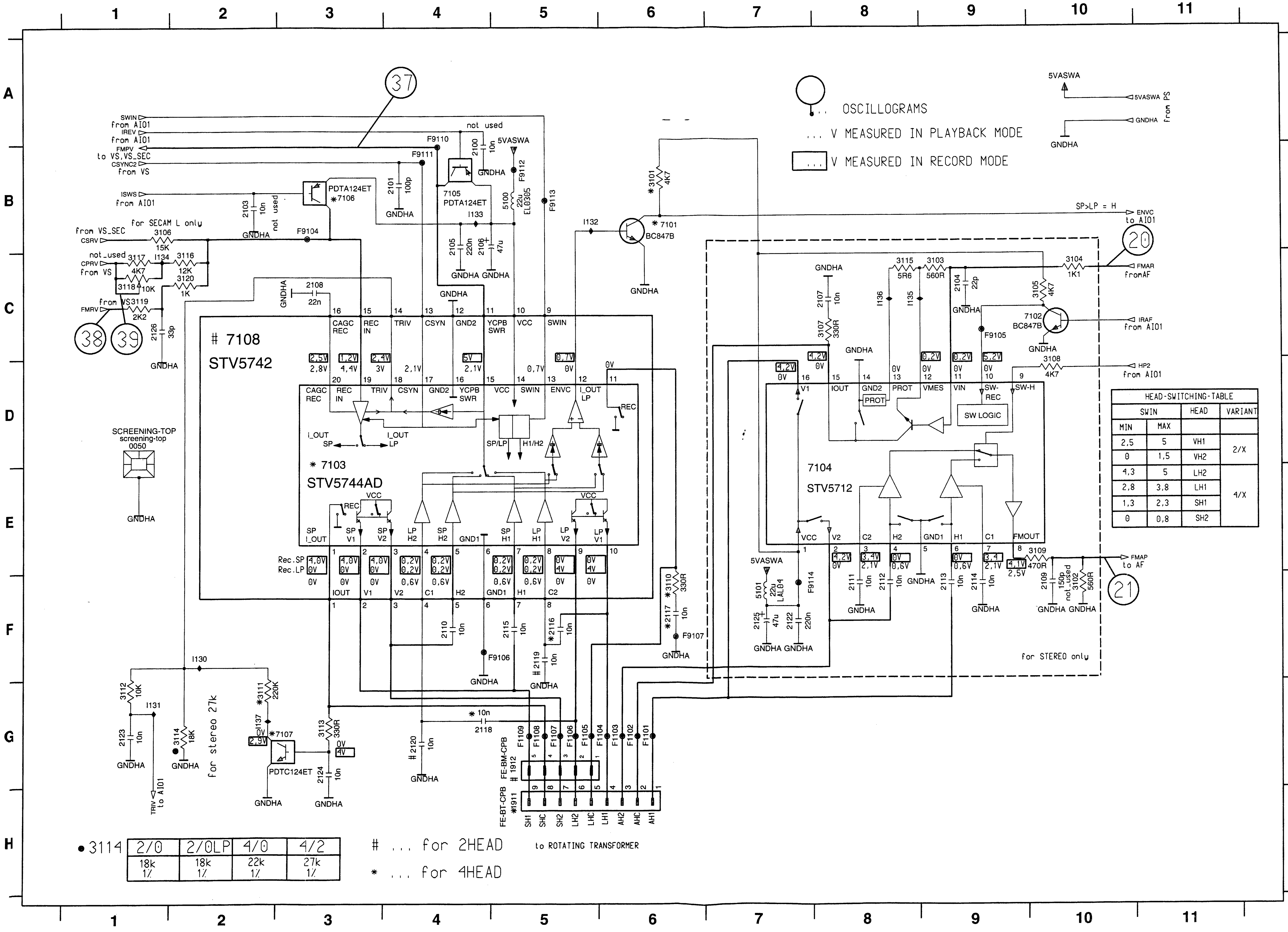
▭..V ...Voltages measured in Record Mode

..V ...Voltages measured in Playback Mode

1001 B4
2000 A2
2001 A6
2002 A5
2003 A9
2004 B4
2005 B5
2006 B5
2007 A13
2008 A13
2009 B7
2010 B4
2011 B6
2012 B4
2013 B5
2014 B2
2015 B6
2016 C1
2017 C9
2018 C9
2019 D12
2020 D11
2021 E9
2022 E9
2023 F9
2024 F9
2025 G9
2026 F2
2027 F7
2028 B8
2029 G8
2030 G3
2031 G8
2032 G3
2033 G4
2034 G4
2035 G5
2036 G6
2037 G6
2038 G6
2039 H13
2040 H7
2041 H8
2042 I8
2043 H6
2044 I2
2045 I1
2047 I13
2048 G7
2049 I7
2050 I8
2052 I4
2053 D11
2054 G3
2055 G2
2056 G3
2057 H3
2060 A4
2093 A2
2094 A1
2095 C9
3001 A4
3002 B4
3003 B1
3004 B4
3005 B5
3006 B3
3007 B7
3008 C1
3009 D13
3010 E1
3011 D12
3012 E13
3013 C9
3014 D2
3017 F6
3018 G4
3019 G6
3020 G6
3021 A1
3022 B1
3023 G4
3024 G6
3025 F6
3026 G7
3027 G7
3029 H7
3030 H5
3031 H6
3032 H8
3034 B3
3035 A1
3037 I3
3038 I2
3040 I6
3041 I5
3042 I6
3046 I8
3047 G1
3048 H1
4001 A7
5001 D11
5002 G6
5003 H12
5004 H7
5005 H5
5006 H7
5008 I12
5009 I4
5010 A2
7001 A4
7002 A1
7003 B12
7004 D12
7005 B2
7006 G7
7007 G8
7008 I2
7009 I8
7010 I5
7011 I6
7014 G2
7015 H2
7016 H2
F9001 B5
F9002 B6
F9003 B7
F9004 D9
F9005 D9
F9006 F7
F9007 G7
F9008 F7
F9009 I2
F9070 C11
F9072 H4
F9073 G5
F9074 B7
I201 C2
I202 D2
I203 E2
I204 E1
I205 F2
I206 F3
I207 G1
I208 G2
I209 G3
I210 G3
I211 I1
I212 G3
I213 I2
I214 G5
I215 A1
I216 F7
I217 A4
I218 H3
I220 I4
I221 H5
I222 H5
I223 I5
I224 I6
I225 I6
I226 I7
I227 H7
I228 I8
I229 H7
I241 G6
I242 G6
I249 H8
I250 F8
I253 E9
I254 E10
I255 D9
I256 C9
I257 C9
I258 C11
I259 D12
I260 D13
I261 A12
I262 A13
I265 A11
I270 A6
I271 B6
I272 B6
I275 B4
I278 B4
I279 B4
I281 B3
I282 B3
I283 A2
I284 A2
I285 H1

PCS 93937

Head Amplifier (HA)


37
38
39
20
21
OSCILLOGRAMS
... V MEASURED IN PLAYBACK MODE
... V MEASURED IN RECORD MODE
SWIN from AI01
IREV from AI01
FMPV to VS,VS_SEC
CSYNC2 from VS
ISWS from AI01
for SECAM L only
CSRV from VS_SEC
not_used CPRV from VS
FMRV from VS
# 7108
STV5742
∗ 7103
STV5744AD
7104
STV5712
PDTA124ET ∗7106
7105 PDTA124ET
∗ 7101 BC847B
7102 BC847B
∗7107 PDTC124ET
5VASWA
GNDHA
not used
SP>LP = H
ENVC to AI01
FMAR fromAF
IRAF from AI01
HP2 from AI01
FMAP to AF
5VASWA from PS
for STEREO only
SCREENING-TOP screening-top 0050
TRIV to AI01
FE-BM-CPB # 1912
FE-BT-CPB ∗1911
SH1 SHC SH2 LH2 LHC LH1 AH2 AHC AH1
to ROTATING TRANSFORMER
SW LOGIC
PROT
for stereo 27k

HEAD-SWITCHING-TABLE			
SWIN		HEAD	VARIANT
MIN	MAX		
2,5	5	VH1	2/X
0	1,5	VH2	
4,3	5	LH2	4/X
2,8	3,8	LH1	
1,3	2,3	SH1	
0	0,8	SH2	

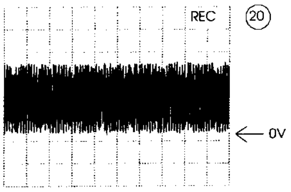
●3114	2/0	2/0LP	4/0	4/2
	18k 1%	18k 1%	22k 1%	27k 1%

# ... for 2HEAD

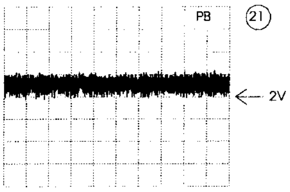
∗ ... for 4HEAD

0050	D1
1911	H5
1912	G5
2100	B4
2101	B4
2103	B2
2104	C9
2105	B4
2106	B4
2107	C8
2108	C3
2109	F10
2110	F4
2111	F8
2112	F8
2113	F9
2114	F9
2115	F5
2116	F5
2117	F6
2118	G4
2119	F5
2120	G4
2122	F7
2123	G1
2124	G3
2125	F7
2126	C1
3101	B6
3102	F10
3103	C9
3104	C10
3105	C10
3106	B1
3107	C8
3108	D10
3109	E10
3110	F6
3111	G2
3112	G1
3113	G3
3114	G2
3115	C8
3116	C2
3117	C1
3118	C1
3119	C1
3120	C2
5100	B5
5101	F7
7101	B6
7102	C10
7103	E3
7104	E7
7105	B4
7106	B3
7107	G3
7108	C2
F1101	G6
F1102	G6
F1103	G6
F1104	G6
F1105	G5
F1106	G5
F1107	G5
F1108	G5
F1109	G5
F9104	B3
F9105	C9
F9106	F5
F9107	F6
F9110	A4
F9111	B4
F9112	B5
F9113	B5
F9114	F7
I130	F2
I131	G1
I132	B5
I133	B4
I134	C1
I135	C8
I136	C8
I137	G2

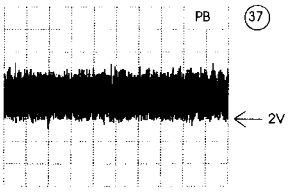
Oscillograms Head Amplifier



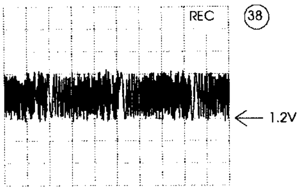
A: DC, 200mV/Div, 5ms/Div
FMAR



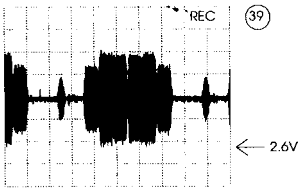
A: AC, 200mV/Div, 500us/Div
FMAP



A: AC, 200mV/Div, 20us/Div
IC 7103 Pin 15



A: AC, 200mV/Div, 20us/Div
FMRV



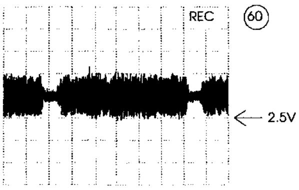
A: AC, 100mV/Div, 10us/Div
CPRV

Interconnections Manual Page

AF 3-26	AIO2 3-41	CNR 3-36	DE 3-42	FF 3-43	FOME 3-44	HA 3-32	PE 3-40	QNIC 3-46	VS 3-31
AIO1 3-38	AL 3-28	DC 3-48	ER 3-27	FM_STEREO 3-25	FV 3-24	I_O 3-37	PS 3-22	VPO 3-45	VS_SEC 3-35

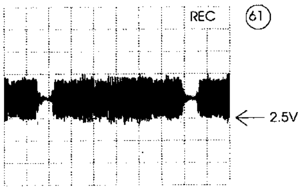
Oscillograms SECAM L Chroma Processing

(60)



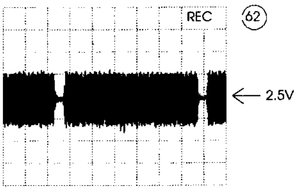
A: AC, 100mV/Div, 10us/Div
IC 7066 Pin 29

(61)



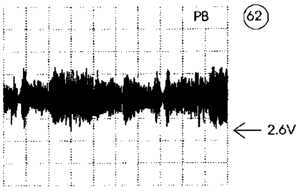
A: AC, 500mV/Div, 10us/Div
IC 7066 Pin 24

(62)



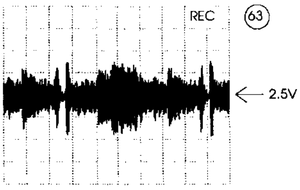
A: AC, 200mV/Div, 10us/Div
IC 7066 Pin 19

(62)



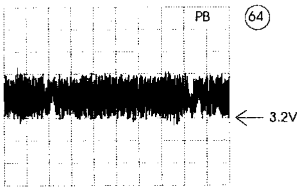
A: AC, 100mV/Div, 10us/Div
IC 7066 Pin 19

(63)



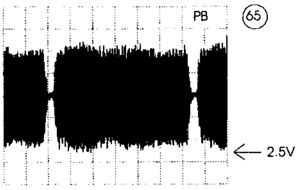
A: AC, 200mV/Div, 10us/Div
IC 7066 Pin 17

(64)



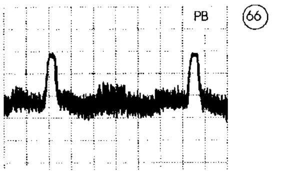
A: AC, 200mV/Div, 10us/Div
IC 7066 Pin 23

(65)



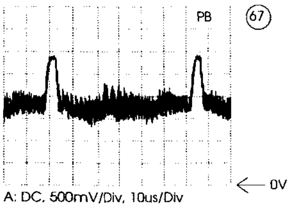
A: AC, 100mV/Div, 10us/Div
IC 7066 Pin 8

(66)



A: DC, 500mV/Div, 10us/Div
IC 7066 Pin 32

(67)

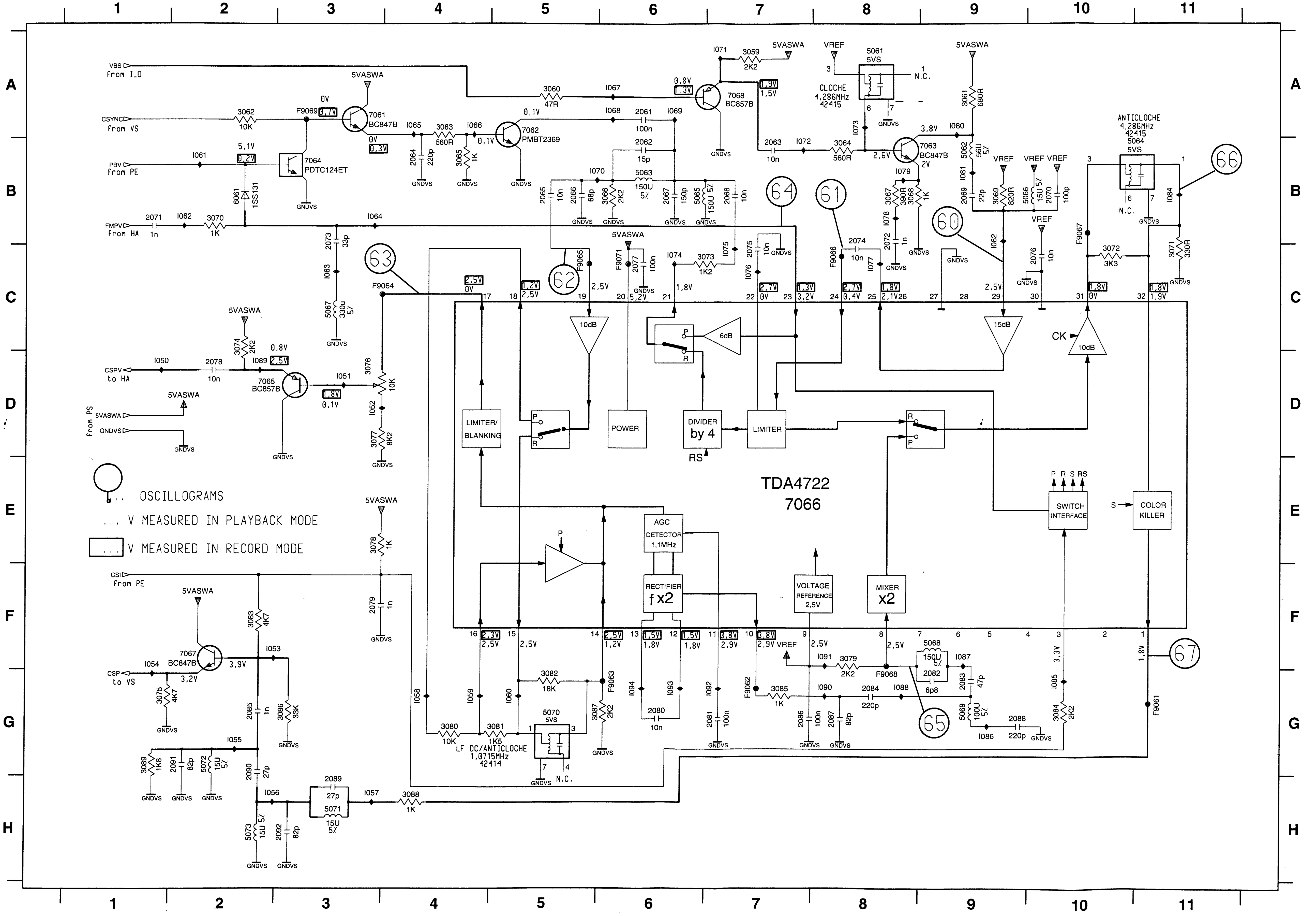


A: DC, 500mV/Div, 10us/Div
IC 7066 Pin 1

Interconnections Manual Page

AF	3-26	AIO2	3-41	CNR	3-36	DE	3-42	FF	3-43	FOME	3-44	HA	3-32	PE	3-40	QNIC	3-46	VS	3-31		
AIO1	3-38	AL	3-28	DC	3-48	ER	3-27	FM_STEREO	3-25	FV	3-24	I_O	3-37	PS	3-22	VPO	3-45	VS_SEC	3-35		

Chroma Processing SECAM L (VS_SECAM)

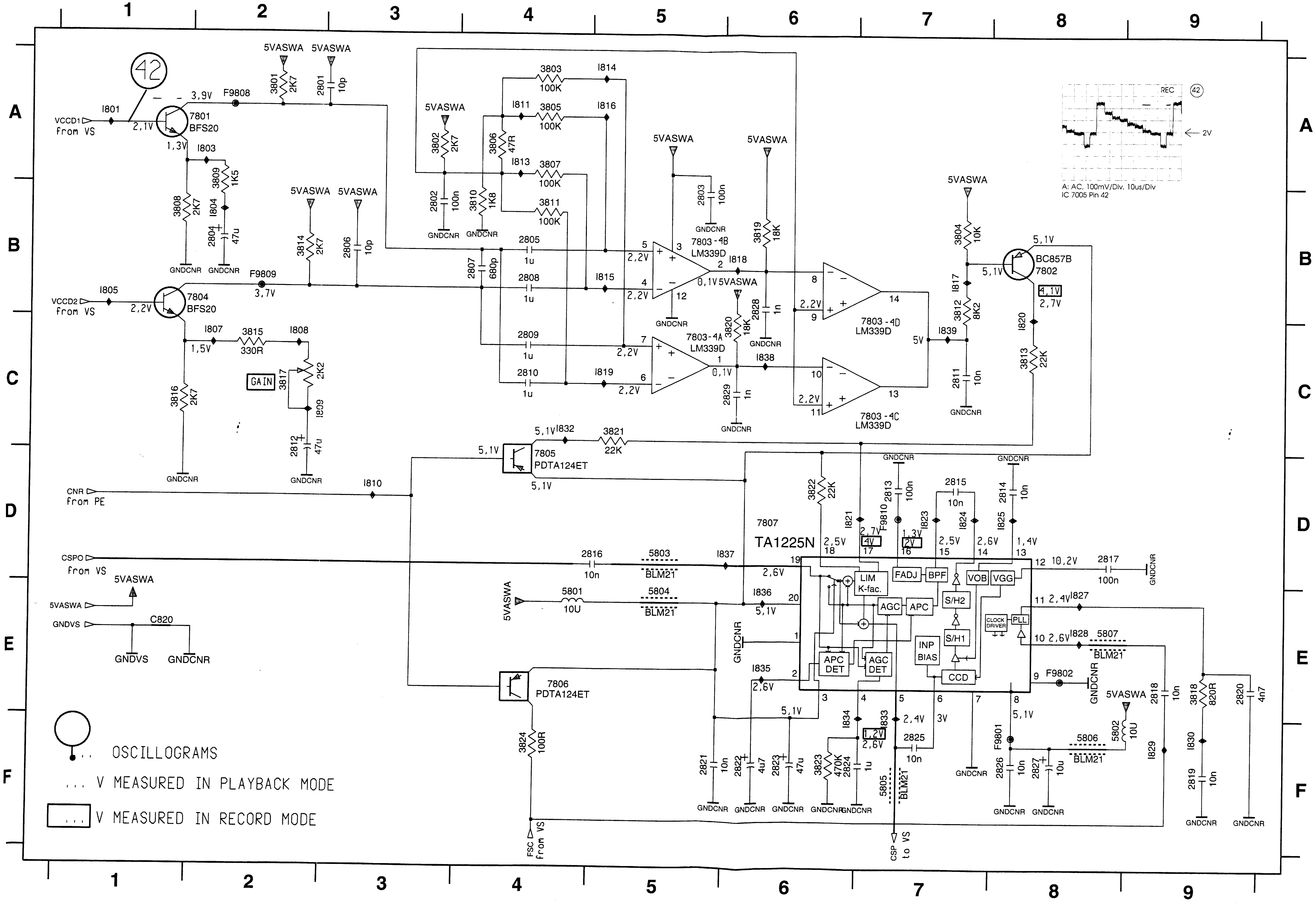

1 2 3 4 5 6 7 8 9 10 11
A B C D E F G H
VBS From I_0
CSYNC From VS
PBV From PE
FMPV From HA
CSRV to HA
From PS 5VASWA GNDVS
CSI From PE
CSP to VS
5VASWA
VREF
GNDVS
3062 10K
F9069
0V
0,7V
7061 BC847B
0V 0,3V
7064 PDTC124ET
5,1V 0,2V
I061
6061 1SS131
2071 1n
I062
3070 1K
I064
I065
3063 560R
I066
2064 220p
3065 1K
7062 PMBT2369
0,1V
3060 47R
I067
I068
2061 100n
I069
2062 15p
I070
5063 150U 5%
2065 10n
2066 68p
3066 2K2
2067 150p
5065 150U 5%
2068 10n
I071
3059 2K2
0,8V 1,3V
7068 BC857B
1,9V 1,5V
2063 10n
I072
3064 560R
5061 5VS
CLOCHE 4,286MHz 42415
N.C.
I073
7063 BC847B
3,8V 2,6V 2V
I080
3061 680R
5062 56U 5%
I081
2069 22p
3069 820R
5066 15U 5%
2070 100p
I079
3067 390R
3068 1K
I078
2072 1n
ANTICLOCHE 4,286MHz 42415 5064 5VS
N.C.
I084
F9067
3072 3K3
3071 330R
2073 33p
I063
5067 330U 5%
F9064
5VASWA
F9071
2077 100n
I074
3073 1K2
I075
2075 10n
I076
2074 10n
I077
F9066
F9065
2076 10n
I082
2,5V 0V
1,2V 2,5V
2,5V
5,2V
1,8V
2,7V 0V
1,3V 3,2V
2,7V 0,4V
1,8V 2,1V
2,5V
1,8V 0V
1,8V 1,9V
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
10dB
6dB
P R
15dB
CK
10dB
LIMITER/ BLANKING
POWER
DIVIDER by 4
RS
LIMITER
TDA4722 7066
SWITCH INTERFACE
P R S RS
S
COLOR KILLER
AGC DETECTOR 1,1MHz
RECTIFIER f x2
VOLTAGE REFERENCE 2,5V
MIXER x2
3074 2K2
0,8V
I089 2,5V
I050
2078 10n
7065 BC857B
I051
1,8V 0,1V
3076 10K
I052
3077 8K2
OSCILLOGRAMS
... V MEASURED IN PLAYBACK MODE
... V MEASURED IN RECORD MODE
3078 1K
2079 1n
3083 4K7
7067 BC847B
I053
I054
3,9V
3,2V
3075 4K7
2085 1n
3086 33K
I055
3089 1K8
2091 82p
5072 15U 5%
2090 27p
I056
2089 27p
5071 15U 5%
I057
3088 1K
5073 15U 5%
2092 82p
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
2,3V 2,5V
2,5V
2,5V 1,2V
1,5V 1,8V
1,5V 1,8V
3,8V 2,9V
3,8V 2,9V
2,5V
2,5V
3,3V
1,8V
I058
I059
I060
3080 10K
3081 1K5
3082 18K
5070 5VS
LF DC/ANTICLOCHE 1,0715MHz 42414
N.C.
F9063
3087 2K2
I094
2080 10n
I093
I092
2081 100n
F9062
3085 1K
I091
3079 2K2
F9068
I090
2084 220p
I088
2086 100n
2087 82p
5068 150U 5%
2082 6p8
I087
2083 47p
5069 100U 5%
2088 220p
I086
I085
3084 2K2
F9061
60 61 62 63 64 65 66 67

0030	H1
2061	A6
2062	B6
2063	B7
2064	B4
2065	B5
2066	B5
2067	B6
2068	B7
2069	B9
2070	B10
2071	B1
2072	B8
2073	B3
2074	B8
2075	C7
2076	C10
2077	C6
2078	D2
2079	F3
2080	G6
2081	G7
2082	G9
2083	G9
2084	G8
2085	G2
2086	G7
2087	G8
2088	G9
2089	H3
2090	G2
2091	G2
2092	H3
3059	A7
3060	A5
3061	A9
3062	A2
3063	A4
3064	B8
3065	B4
3066	B6
3067	B8
3068	B8
3069	B9
3070	B2
3071	C11
3072	C10
3073	C6
3074	C2
3075	G1
3076	D3
3077	D3
3078	E3
3079	F8
3080	G4
3081	G5
3082	G5
3083	F2
3084	G10
3085	G7
3086	G3
3087	G6
3088	H4
3089	G1
5061	A8
5062	B9
5063	B6
5064	B10
5065	B6
5066	B9
5067	C3
5068	F9
5069	G9
5070	G5
5071	H3
5072	G2
5073	H2
6061	B2
7061	A3
7062	A5
7063	B8
7064	B3
7065	D2
7066	E7
7067	F2
7068	A7
F9061	G11
F9062	G7
F9063	G6
F9064	C3
F9065	C5
F9066	C8
F9067	B10
F9068	G8
F9069	A3
F9071	C6
I050	D1
I051	D3
I052	D3
I053	F2
I054	F1
I055	G2
I056	H2
I057	H3
I058	G4
I059	G4
I060	G5
I061	B2
I062	B2
I063	C3
I064	B3
I065	A4
I066	A4
I067	A6
I068	A6
I069	A6
I070	B5
I071	A7
I072	B7
I073	A8
I074	C6
I075	C7
I076	C7
I077	C8
I078	B8
I079	B8
I080	A9
I081	B9
I082	B9
I084	B11
I085	G1(
I086	G9
I087	F9
I088	G8
I089	D2
I090	G8
I091	F8
I092	G7
I093	G6
I094	G6

Chroma Noise Reduction (CNR)

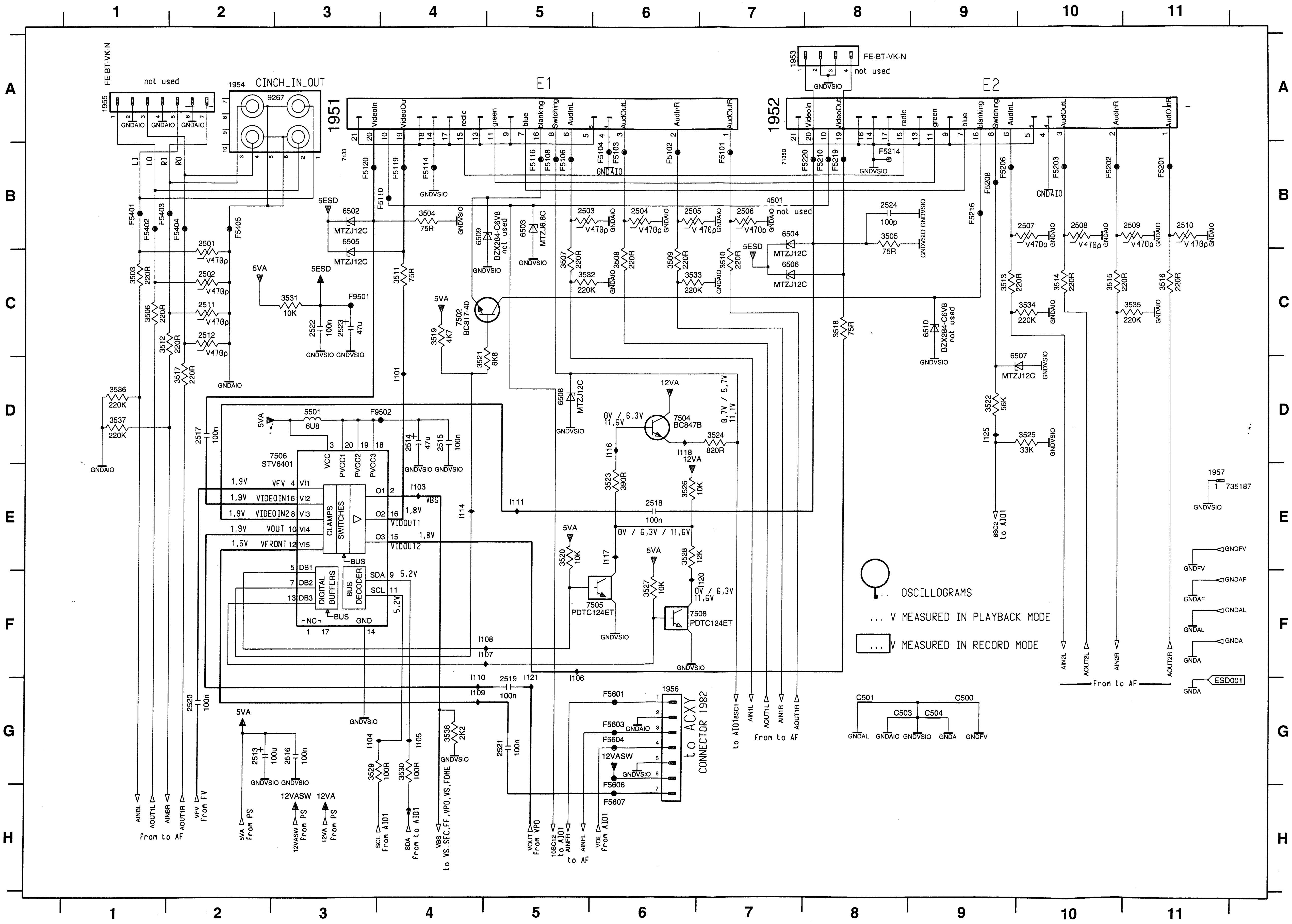
Interconnections Manual Page

AF 3-26	AIO2 3-41	CNR 3-36	DE 3-42	FF 3-43	FOME 3-44	HA 3-32	PE 3-40	QNIC 3-46	VS 3-31		
AIO1 3-38	AL 3-28	DC 3-48	ER 3-27	FM_STEREO 3-25	FV 3-24	I_O 3-37	PS 3-22	VPO 3-45	VS_SEC 3-35		


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
42
VCCD1
from VS
1801
2,1V
- - 3,9V
F9808
7801
BFS20
1,3V
1803
3808
2K7
3809
1K5
1804
2804
47u
GNDCNR
5VASWA
3801
2K7
2801
10p
3814
2K7
2806
10p
F9809
3,7V
VCCD2
from VS
1805
2,2V
7804
BFS20
1807
1,5V
3815
330R
1808
GAIN
3817
2K2
1809
2812
47u
3816
2K7
3802
2K7
2802
100n
3806
47R
3810
1K8
1811
1813
3803
100K
1814
3805
100K
1816
3807
100K
3811
100K
2805
1u
2807
680p
2808
1u
1815
2809
1u
2810
1u
1819
2,2V
7803-4B
LM339D
1818
0,1V
12
2803
100n
7803-4A
LM339D
0,1V
3820
18K
2828
1n
1838
2829
1n
3819
18K
7803-4D
LM339D
7803-4C
LM339D
5V
1839
3804
10K
1817
3812
8K2
2811
10n
BC857B
7802
5,1V
4,1V
2,7V
1820
3813
22K
REC
2V
A: AC, 100mV/Div, 10us/Div
IC 7005 Pin 42
5,1V
1832
3821
22K
7805
PDTA124ET
CNR
from PE
1810
CSPO
from VS
5VASWA
GNDVS
C820
2816
10n
5803
BLM21
1837
5801
10U
5804
BLM21
1836
5,1V
2,6V
7807
TA1225N
3822
22K
1821
F9810
2813
100n
1823
2815
10n
1824
1825
2814
10n
2,7V
4V
1,3V
2V
2,5V
2,6V
1,4V
LIM
K-fac.
FADJ
BPF
VOB
VGG
AGC
APC
S/H2
S/H1
CLOCK DRIVER
PLL
INP BIAS
APC DET
AGC DET
CCD
12 10,2V
2817
100n
11 2,4V
1827
10 2,6V
1828
5807
BLM21
9
F9802
1835
2,6V
7806
PDTA124ET
3824
100R
FSC
from VS
1834
1833
1,2V
2,6V
2,4V
3V
2825
10n
5,1V
F9801
5806
BLM21
5802
10U
2821
10n
2822
4u7
2823
47u
3823
470K
2824
1u
5805
BLM21
CSP
to VS
2826
10n
2827
10u
2818
10n
1829
3818
820R
1830
2819
10n
2820
4n7
OSCILLOGRAMS
... V MEASURED IN PLAYBACK MODE
... V MEASURED IN RECORD MODE

2801	A2
2802	B3
2803	B5
2804	B2
2805	B4
2806	B3
2807	B4
2808	B4
2809	C4
2810	C4
2811	C7
2812	C2
2813	D7
2814	D8
2815	D7
2816	D5
2817	D8
2818	E9
2819	F9
2820	E9
2821	F5
2822	F6
2823	F6
2824	F6
2825	F7
2826	F8
2827	F8
2828	B6
2829	C6
3801	A2
3802	A3
3803	A4
3804	B7
3805	A4
3806	A4
3807	A4
3808	B1
3809	A2
3810	B4
3811	B4
3812	B7
3813	C8
3814	B2
3815	C2
3816	C1
3817	C2
3818	E9
3819	B6
3820	C6
3821	C5
3822	D6
3823	F6
3824	F4
5801	E4
5802	F8
5803	D5
5804	E5
5805	F7
5806	F8
5807	E8
7801	A1
7802	B8
7803	B5
7803	C5
7803	B7
7803	C7
7804	B1
7805	D4
7806	E4
7807	D6
C820	E1
F9801	F8
F9802	E8
F9808	A2
F9809	B2
F9810	D'
I801	A1
I803	A2
I804	B2
I805	B1
I807	C2
I808	C2
I809	C2
I810	D3
I811	A4
I813	A4
I814	A5
I815	B5
I816	A5
I817	B7
I818	B6
I819	C5
I820	B8
I821	D6
I823	D7
I824	D7
I825	D8
I827	E8
I828	E8
I829	F9
I830	F9
I832	C4
I833	E7
I834	E6
I835	E6
I836	E6
I837	D6
I838	C6
I839	C7

Input/Output (I_O)


1
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8
9
10
11
A
B
C
D
E
F
G
H
FE-BT-VK-N
not used
1955
GNDAIO
1954 CINCH_IN_OUT
9267
E1
1951
VideoIn
VideoOut
redic
green
blue
blanking
Switching
AudInL
AudOutL
AudInR
AudOutR
E2
1952
1953
FE-BT-VK-N
not used
GNDVSIO
L1
L0
R1
R0
F5401
F5402
F5403
F5404
F5405
F5120
F5119
F5110
F5114
F5116
F5108
F5106
F5104
F5103
F5102
F5101
GNDAIO
F5220
F5210
F5219
F5214
F5216
F5208
F5206
F5203
F5202
F5201
5ESD
6502
MTZJ12C
6505
MTZJ12C
3504
75R
6509
BZX284-C6V8
not used
6503
MTZJ6.8C
2503
2504
2505
2506
V470p
4501
not used
2524
100p
3505
75R
6504
MTZJ12C
6506
MTZJ12C
2507
2508
2509
2510
2501
2502
2511
2512
3503
220R
3506
3512
3517
5VA
5ESD
3531
10K
F9501
2522
100n
2523
47u
3511
75R
3507
3508
3509
3510
3532
220K
3533
3518
6510
BZX284-C6V8
3513
3514
3515
3516
3534
3535
7502
BC817-40
3519
4K7
3521
6K8
I101
3536
220K
3537
2517
100n
5501
6U8
F9502
2514
47u
2515
6508
MTZJ12C
12VA
7504
BC847B
0V / 6,3V
11,6V
3524
820R
0,7V / 5,7V
11,1V
I116
I118
6507
3522
56K
3525
33K
I125
7506
STV6401
VCC
PVCC1
PVCC2
PVCC3
1,9V VFV 4 VI1
1,9V VIDEOIN1 6 VI2
1,9V VIDEOIN2 8 VI3
1,9V VOUT 10 VI4
1,5V VFRONT 12 VI5
CLAMPS
SWITCHES
O1
O2 16 VIDOUT1
O3 15 VIDOUT2
1,8V
VBS
I103
I114
I111
BUS
DB1
DB2
DB3
DIGITAL BUFFERS
BUS DECODER
SDA 9 5,2V
SCL 11
NC
GND
3523
390R
3526
10K
2518
100n
0V / 6,3V / 11,6V
3520
10K
I117
3528
12K
I120
3527
10K
7505
PDTC124ET
7508
PDTC124ET
8SC2 to AI01
1957
735187
GNDFV
GNDAF
GNDAL
GNDA
ESD001
OSCILLOGRAMS
... V MEASURED IN PLAYBACK MODE
... V MEASURED IN RECORD MODE
I108
I107
I110
I109
2519
100n
I121
I106
2520
100n
5VA
2513
100u
2516
100n
GNDVSIO
I104
I105
3529
100R
3530
100R
3538
2K2
2521
100n
1956
F5601
F5603
F5604
12VASW
F5606
F5607
to ACXY CONNECTOR 1982
C501
C500
C503
C504
GNDAL
GNDAIO
GNDVSIO
GNDA
GNDFV
AINBL
AOUT1L
AINBR
AOUT1R
VFV
from FV
from to AF
5VA from PS
12VASW from PS
12VA from PS
SCL from AI01
SDA from to AI01
VBS to VS_SEC,FF,VPO,VS,FDME
VOUT from VPO
10SC12 to AI01
AINFR to AF
AINFL
VOL from AI01
to AI01 8SC1
AIN1L
AOUT1L
AIN1R
AOUT1R
from to AF
AIN2L
AOUT2L
AIN2R
AOUT2R
from to AF

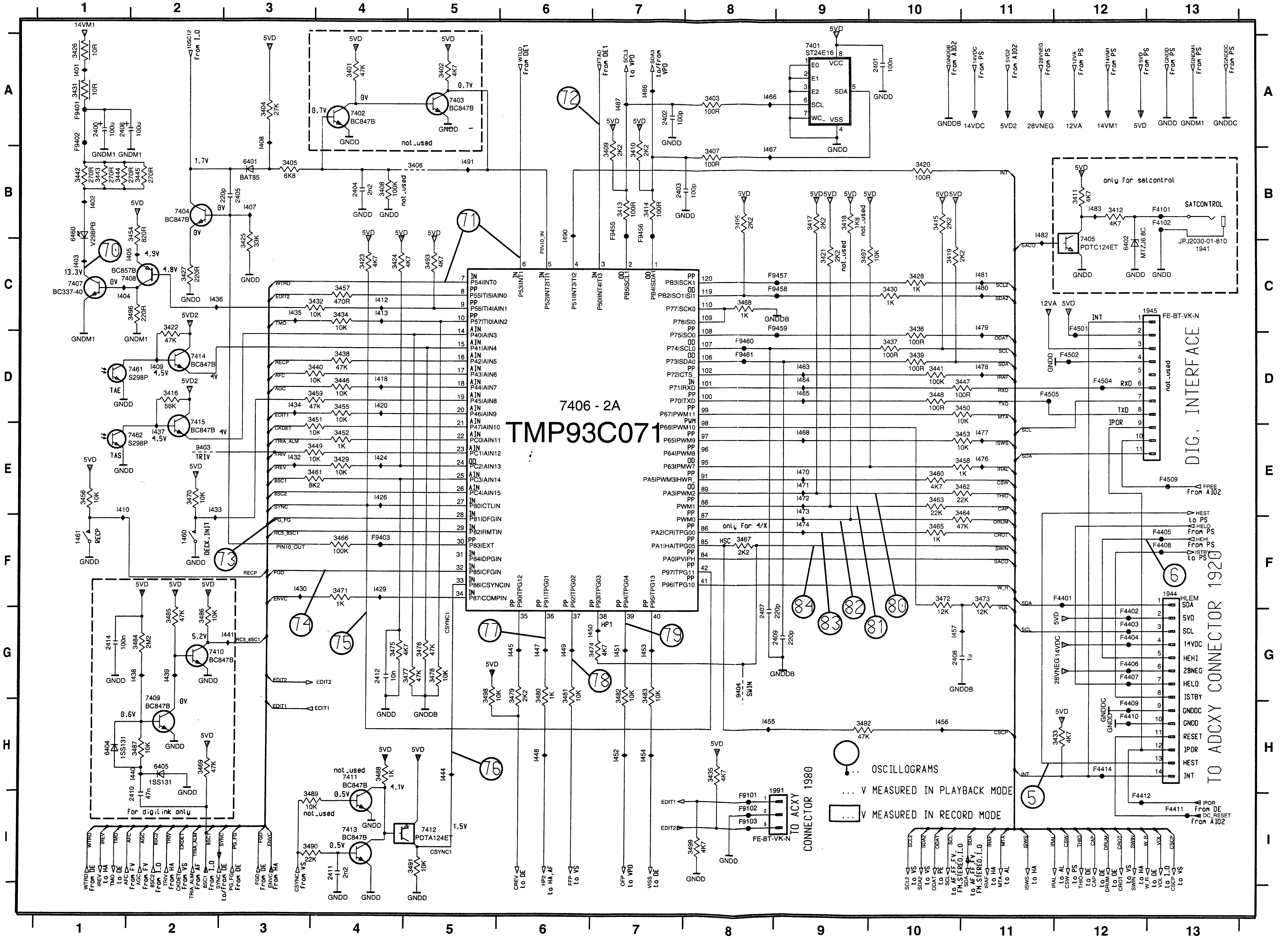
1951	A3
1952	A7
1953	A7
1954	A2
1955	A1
1956	G6
1957	E11
2501	B2
2502	C2
2503	B5
2504	B6
2505	B6
2506	B7
2507	B10
2508	B10
2509	B11
2510	B11
2511	C2
2512	C2
2513	G2
2514	D4
2515	D4
2516	G3
2517	D2
2518	E6
2519	G5
2520	G2
2521	G5
2522	C3
2523	C3
2524	B8
3503	C1
3504	B4
3505	B8
3506	C1
3507	C5
3508	C6
3509	C6
3510	C7
3511	C4
3512	C1
3513	C9
3514	C10
3515	C10
3516	C11
3517	D2
3518	C8
3519	C4
3520	E5
3521	D4
3522	D9
3523	E6
3524	D7
3525	D10
3526	E6
3527	F6
3528	E6
3529	G3
3530	G4
3531	C3
3532	C5
3533	C6
3534	C10
3535	C11
3536	D1
3537	D1
3538	G4
4501	B7
5501	D3
6502	B3
6503	B5
6504	B7
6505	B3
6506	C7
6507	D10
6508	D5
6509	B4
6510	C9
7502	C4
7504	D6
7505	F5
7506	D2
7508	F6
C500	G9
C501	G8
C503	G8
C504	G9
ESD001	G11
F5101	B7
F5102	B6
F5103	B6
F5104	B6
F5106	B5
F5108	B5
F5110	B4
F5114	B4
F5116	B5
F5119	B4
F5120	B3
F5201	B11
F5202	B1
F5203	B1
F5206	B9
F5208	B9
F5210	B8
F5214	B8
F5216	B9
F5219	B8
F5220	B8
F5401	B1
F5402	B1
F5403	B1
F5404	B2
F5405	B2
F5601	G6
F5603	G6
F5604	G6
F5606	G6
F5607	H6
F9501	C3
F9502	D4
I101	D4
I103	E4
I104	G3
I105	G4
I106	G5
I107	F5
I108	F5
I109	G4
I110	G4
I111	E5
I114	E4
I116	D6
I117	E6
I118	D6
I120	F7
I121	G5
I125	D9

PCS 93943

Central / Deck Control 1 (AIO1)

Interconnections Manual Page

AF 3-26	AIO2 3-41	CNR 3-36	DE 3-42	FF 3-43	FOME 3-44	HA 3-32	PE 3-40	QNIC 3-46	VS 3-31
AIO1 3-38	AL 3-28	DC 3-48	ER 3-27	FM_STEREO 3-25	FV 3-24	I_O 3-37	PS 3-22	VPO 3-45	VS_SEC 3-35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A
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I
7406 - 2A
TMP93C071
7401
ST24E16
VCC
E0
E1
E2
SCL
WC_
VSS
SDA
not_used
7402 BC847B
7403 BC847B
7404 BC847B
7405 PDTC124ET
7407 BC337-40
7408 BC857B
7409 BC847B
7410 BC847B
7411 BC847B
7412 PDTA124ET
7413 BC847B
7414 BC847B
7415 BC847B
7461 S298P
7462 S298P
TAE
TAS
RECP
DECK_INIT
TRIV
for digilink only
only for setcontrol
SATCONTROL
JPJ2030-01-810
1941
1945 FE-BT-VK-N
DIG. INTERFACE
not_used
INT
RXD
TXD
IPOR
1944
HLEM
SDA
5VD
SCL
14VDC
HEHI
28NEG
HELO
ISTBY
GNDDC
GNDD
RESET
IPOR
HEST
INT
TO ADCXY CONNECTOR 1920
1991
FE-BT-VK-N
TO ACXY CONNECTOR 1980
OSCILLOGRAMS
... V MEASURED IN PLAYBACK MODE
V MEASURED IN RECORD MODE
only for 4/X
5VD
5VD2
GNDD
GNDDB
GNDDC
GNDM1
14VDC
28VNEG
12VA
14VM1
FREE From AIO2
HEST to PS
HELO From PS
HEHI From PS
ISTBY to PS
IPOR From DE
DC_RESET From AIO2
WTRD From DE
IREV to DE
TMO to DE
AFC From FV
AGC From FV
8SC2 From I_O
TRIV From VS
CKDET From AF
TRIA_ALM From AF
8SC1 From I_O
SYNC From DE
PG_FG to/From DE
FGD From DE
ENVC From HA
CSYNC From VS
CREV to DE
HP2 to HA,AF
FFP to VS
OFP to VPO
VSS to DE
SCL2 to VS
SDA2 to VS
ODAT to PE
SCL to AF,FF,FV,FM_STEREO,I_O
SDA to AF,FF,FV,FM_STEREO,I_O
IRAF to HA
MTA to AL
ISWS to HA
IRAL to AL
CSW to PS
THIO to DE
CAP to DE
DRUM to DE
CROT to VS
SWIN to VS
W_R to I_O
VOL to I_O
CSCP to VS
EDIT1
EDIT2
70
71
72
73
74
75
76
77
78
79
80
81
82
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84
5
6

0020	D1
0021	B1
0022	E1
0031	F1
1460	F2
1461	F1
1941	C13
1944	F13
1945	C12
1991	I8
2400	A1
2401	A10
2402	A7
2403	B7
2404	B4
2405	B3
2406	A1
2407	G8
2408	G10
2409	G9
2410	I2
2411	I4
2412	G4
2414	G1
3401	A4
3402	A5
3403	A8
3404	A3
3405	B3
3406	B5
3407	B8
3408	B4
3409	B7
3410	B7
3411	B12
3412	B12
3413	B7
3414	B7
3415	B10
3416	D2
3417	B9
3418	B9
3419	C10
3420	B10
3421	C9
3422	C2
3423	C4
3424	C4
3425	C3
3426	A1
3427	C2
3428	C10
3429	E4
3430	C10
3431	A1
3432	C4
3433	H12
3434	C4
3435	H8
3436	C10
3437	D10
3438	D4
3439	D10
3440	D4
3441	D10
3442	B1
3443	B1
3444	B1
3445	B2
3446	D4
3447	D11
3448	D10
3449	E4
3450	D11
3451	D4
3452	E4
3453	E11
3454	B2
3455	D4
3456	E1
3457	C4
3458	E11
3459	D4
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3461	E4
3462	E11
3463	E10
3464	E11
3465	F10
3466	F4
3467	F8
3468	C8
3469	H2
3470	E2
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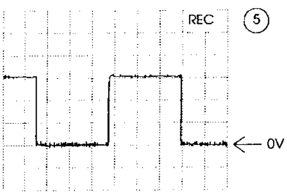
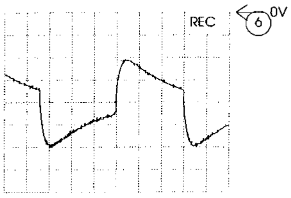
3483	G7
3484	G2
3485	G2
3486	G2
3487	H2
3488	H4
3489	I3
3490	I3
3491	I5
3492	H9
3493	C5
3495	B8
3496	C2
3497	C9
3498	G5
3499	I8
6401	B3
6402	C12
6404	H1
6405	H2
6460	B1
7401	A9
7402	A4
7403	A5
7404	B2
7405	C12
7406	D6
7407	C1
7408	C2
7409	H2
7410	G2
7411	H4
7412	I5
7413	I4
7414	D2
7415	E2
7461	D1
7462	E1
9403	E2
9404	G8
F4101	B13
F4102	B13
F4401	F12
F4402	G12
F4403	G12
F4404	G12
F4405	F13
F4406	G12
F4407	G12
F4408	F13
F4409	H12
F4410	H12
F4411	I13
F4412	I12
F4414	H12
F4501	C12
F4502	D12
F4504	D12
F4505	D11
F4509	E13
F9101	I8
F9102	I8
F9103	I8
F9401	A1
F9402	A1
F9403	F4
F9455	B7
F9456	B7
F9457	C9
F9458	C9
F9459	C9
F9460	D8
F9461	D8
I401	A1
I402	B1
I403	C1
I404	C1
I405	C1
I407	B3
I408	A3
I409	D2
I410	E1
I412	C4
I413	C4
I418	D4
I420	D4
I424	E4
I426	E4
I429	F4
I430	F3
I432	E3
I433	E2
I434	D3
I435	C3
I436	C2
I437	E2
I438	G2
I439	G2
I440	H2
I441	G3
I444	H5
I445	G6
I447	G6
I448	H6
I449	G6
I450	G6
I451	G7
I452	H7
I453	G7
I454	H7
I455	H8
I456	H10
I457	G10
I463	D9
I464	D9
I465	D9
I466	A8
I467	B8
I468	E9
I470	E9
I471	E9
I472	E9
I473	E9
I474	F9
I476	E11
I477	E11
I478	D11
I479	C11
I480	C11
I481	C11
I482	B11
I483	B12
I486	A7
I487	A7
I490	B6
I491	B5

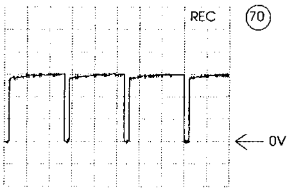
Oscillograms Central / Deck Control



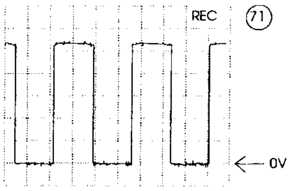
A: DC, 500mV/Div, 5us/Div
Connector 1944 Pin 13



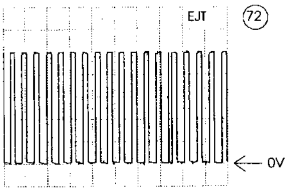
A: DC, 5 V/Div, 5us/Div
Connector 1944 Pin 5



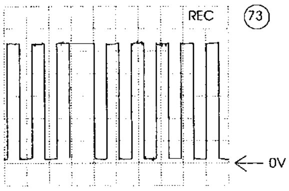
A: DC, 5 V/Div, 5ms/Div
Collector 7407



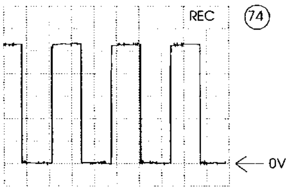
A: DC, 1 V/Div, 200ms/Div
IC 7406 Pin 6/7



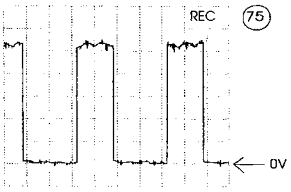
A: DC, 1 V/Div, 20ms/Div
IC 7406 Pin 3



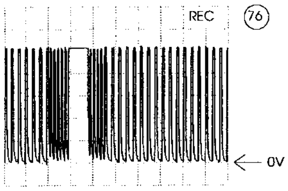
A: DC, 1 V/Div, 2ms/Div
IC 7406 Pin 28



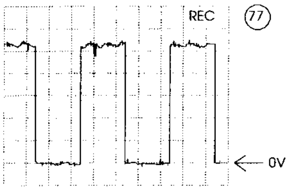
A: DC, 1 V/Div, 500us/Div
IC 7406 Pin 32



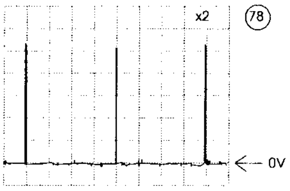
A: DC, 1 V/Div, 10ms/Div
IC 7406 Pin 27/42



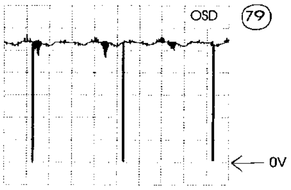
A: DC, 1 V/Div, 200us/Div
IC 7406 Pin 33



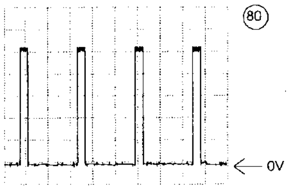
A: DC, 1 V/Div, 10ms/Div
IC 7406 Pin 36



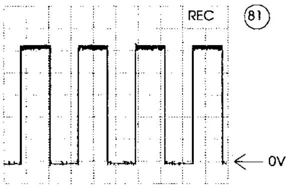
A: DC, 1 V/Div, 5ms/Div
IC 7406 Pin 37



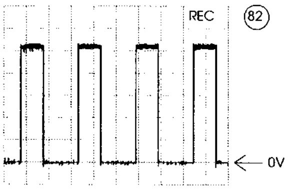
A: DC, 1 V/Div, 5ms/Div
IC 7406 Pin 39



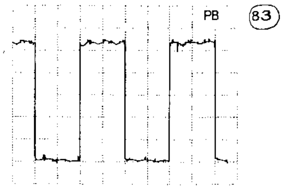
A: DC, 1 V/Div, 10us/Div
IC 7406 Pin 89



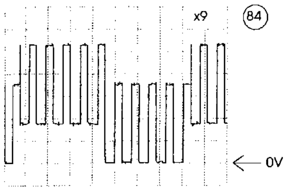
A: DC, 1 V/Div, 10us/Div
IC 7406 Pin 88



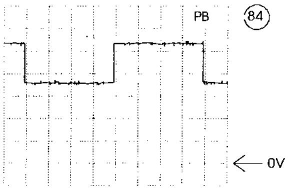
A: DC, 1 V/Div, 10us/Div
IC 7406 Pin 87



A: DC, 1 V/Div, 10ms/Div
IC 7406 Pin 86

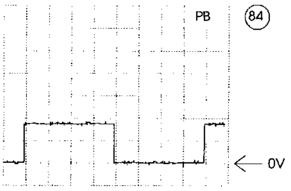


A: DC, 1 V/Div, 5ms/Div
SWIN



A: DC, 1 V/Div, 5ms/Div
SWIN

Longplay

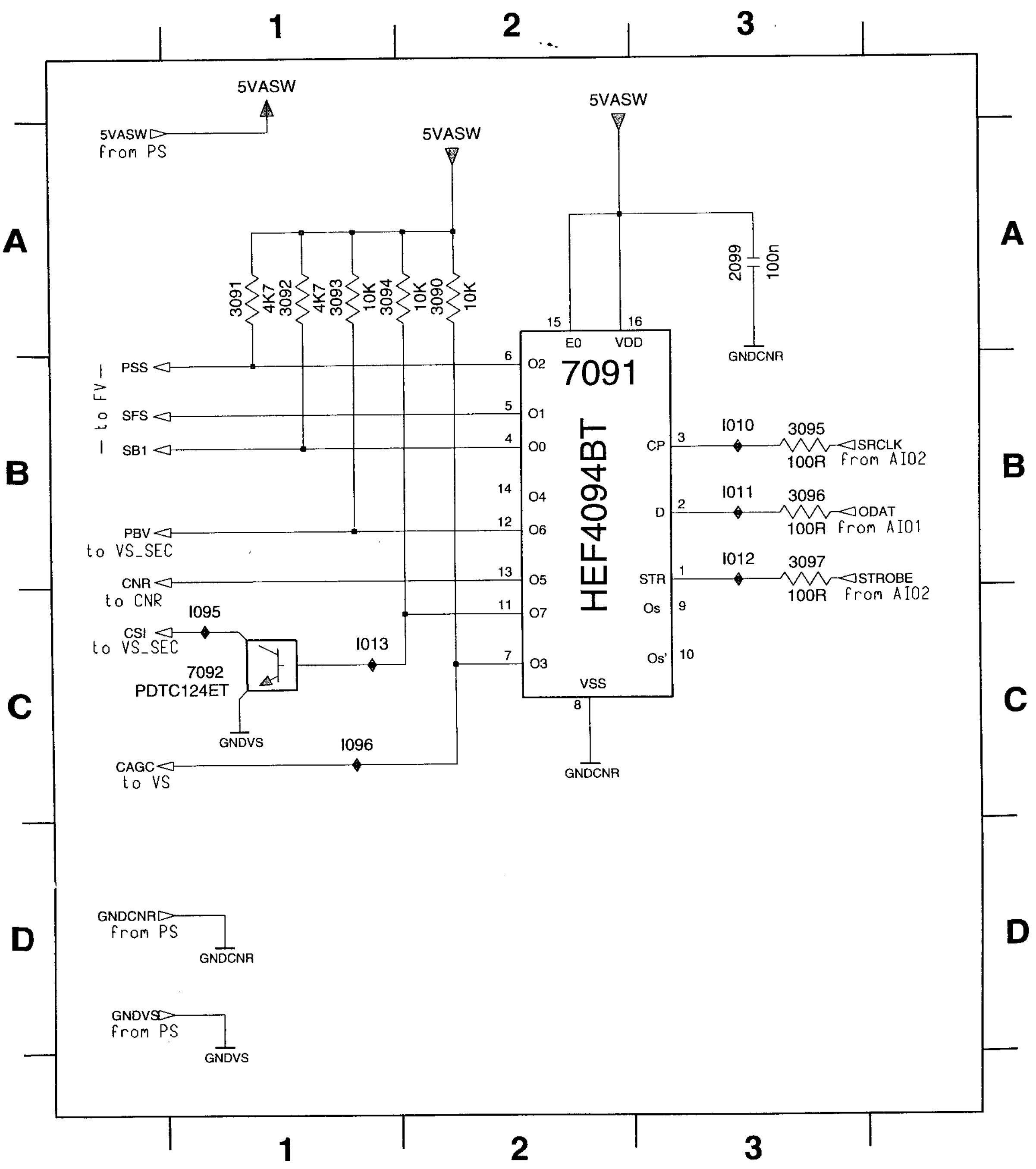


A: DC, 1 V/Div, 5ms/Div
SWIN

Standard Play

Port Expander (PE)

2099	A3
3090	A2
3091	A1
3092	A1
3093	A1
3094	A1
3095	B3
3096	B3
3097	B3
7091	B2
7092	C1
I010	B3
I011	B3
I012	B3
I013	C1
I095	C1
I096	C1


1
2
3
A
B
C
D
5VASW
5VASW
from PS
5VASW
5VASW
2099
100n
GNDCNR
3091
4K7
3092
4K7
3093
10K
3094
10K
3090
10K
15
16
E0
VDD
7091
HEF4094BT
PSS
SFS
SB1
— to FV —
6
O2
5
O1
4
O0
14
O4
12
O6
13
O5
11
O7
7
O3
CP
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D
2
STR
1
Os
9
Os'
10
VSS
8
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3095
100R
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from AI02
I011
3096
100R
ODAT
from AI01
I012
3097
100R
STROBE
from AI02
PBV
to VS_SEC
CNR
to CNR
I095
CSI
to VS_SEC
I013
7092
PDTC124ET
GNDVS
I096
CAGC
to VS
GNDCNR
from PS
GNDCNR
GNDVS
from PS
GNDVS

Central / Deck Control 2 (AIO2)

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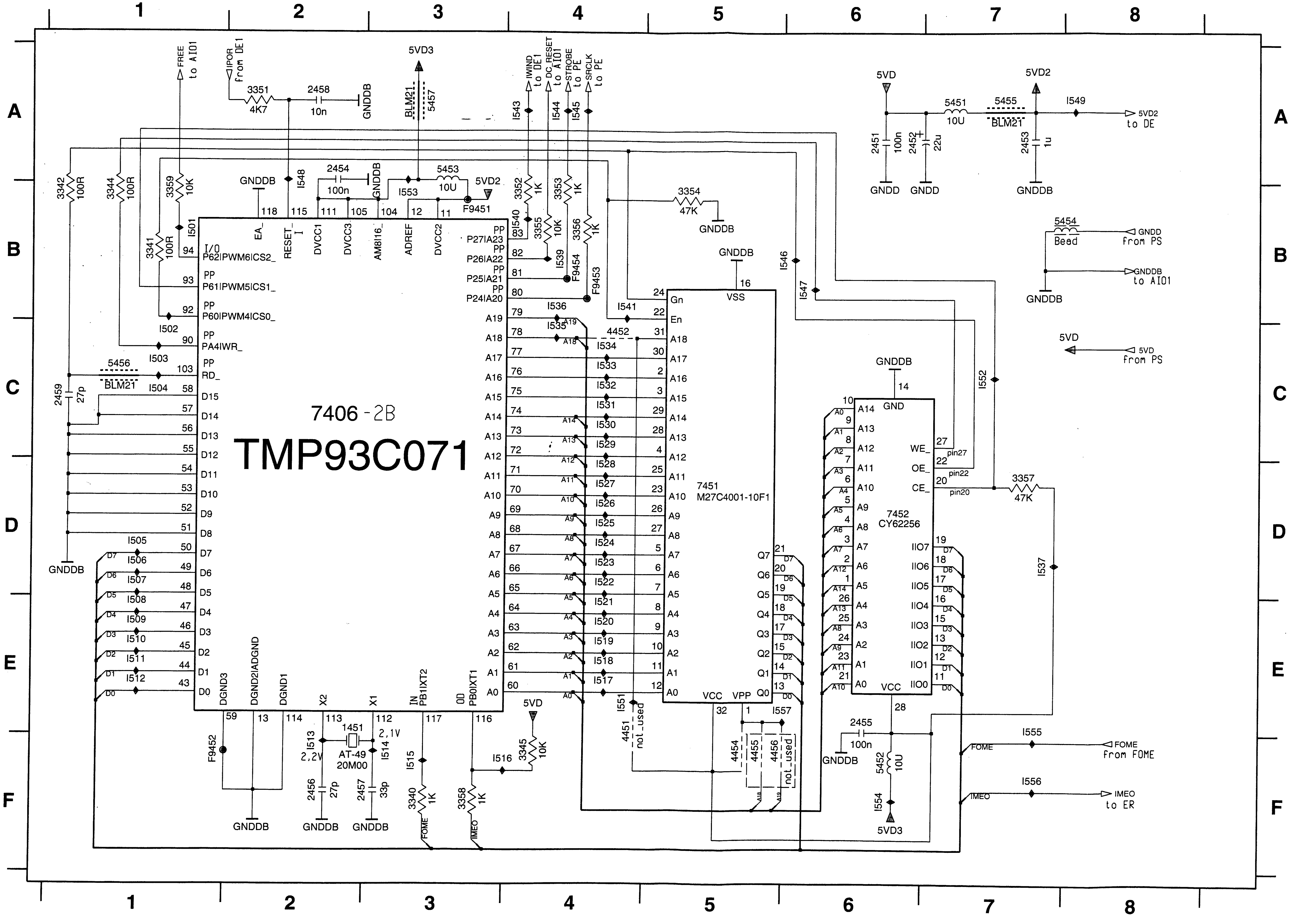
AIO1 3-38	AL 3-28	DC 3-48	ER 3-27	FM_STEREO 3-25	FV 3-24	I_O 3-37	PS 3-22	VPO 3-45	VS_SEC 3-35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A
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E
F
FREE to AIO1
IPOR from DE1
3351 4K7
2458 10n
GNDDB
5VD3
BLM21
5457
IWIND to DE1
DC_RESET to AIO1
STROBE to PE
SRCLK to PE
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I544
I545
3342 100R
3344 100R
3359 10K
3341 100R
I501
I548
2454 100n
5453 10U
5VD2
I553
F9451
3352 1K
3353 1K
3355 10K
3356 1K
I540
I539
F9454
F9453
3354 47K
I546
I547
I541
I536
I535
I534
4452
7406 -2B
TMP93C071
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P61|PWM5|CS1_
P60|PWM4|CS0_
PA4|WR_
RD_
EA_
RESET_
DVCC1
DVCC3
AM8|16_
ADREF
DVCC2
P27|A23
P26|A22
P25|A21
P24|A20
A19
A18
A17
A16
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
D15
D14
D13
D12
D11
D10
D9
D8
D7
D6
D5
D4
D3
D2
D1
D0
DGND3
DGND2|ADGND
DGND1
X2
X1
PB1|XT2
PB0|XT1
5456 BLM21
I502
I503
I504
2459 27p
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I506
I507
I508
I509
I510
I511
I512
F9452
1451 AT-49 20M00
I513 2,2V
I514 2,1V
2456 27p
2457 33p
I515
3340 1K
FOME
3358 1K
IMEO
I516
5VD
3345 10K
I517
I518
I519
I520
I521
I522
I523
I524
I525
I526
I527
I528
I529
I530
I531
I532
I533
I551
4451 not_used
7451 M27C4001-10F1
Gn
En
VSS
VCC
VPP
Q7
Q6
Q5
Q4
Q3
Q2
Q1
Q0
I557
4454
4455
4456 not_used
5VD
2451 100n
2452 22u
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5451 10U
5455 BLM21
2453 1u
I549
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5454 Bead
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GNDDB to AIO1
5VD from PS
GNDDB
7452 CY62256
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A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
WE_
OE_
CE_
pin27
pin22
pin20
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I/O5
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I/O2
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2455 100n
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2451	A6
2452	A6
2453	A7
2454	A2
2455	E6
2456	F2
2457	F3
2458	A2
2459	C1
3340	F3
3341	B1
3342	B1
3344	B1
3345	F4
3351	A2
3352	B4
3353	B4
3354	B5
3355	B4
3356	B4
3357	D7
3358	F3
3359	B1
4451	E4
4452	C4
4454	F5
4455	F5
4456	F5
5451	A7
5452	F6
5453	A3
5454	B8
5455	A7
5456	C1
5457	A3
7406	C2
7451	D5
7452	D6
F9451	B3
F9452	F1
F9453	B4
F9454	B4
I501	B1
I502	C1
I503	C1
I504	C1
I505	D1
I506	D1
I507	D1
I508	E1
I509	E1
I510	E1
I511	E1
I512	E1
I513	F2
I514	F3
I515	F3
I516	F4
I517	E4
I518	E4
I519	E4
I520	E4
I521	E4
I522	D4
I523	D4
I524	D4
I525	D4
I526	D4
I527	D4
I528	D4
I529	C4
I530	C4
I531	C4
I532	C4
I533	C4
I534	C4
I535	C4
I536	B4
I537	D7
I539	B4
I540	B4
I541	B4
I543	A4
I544	A4
I545	A4
I546	B5
I547	B6
I548	A2
I549	A8
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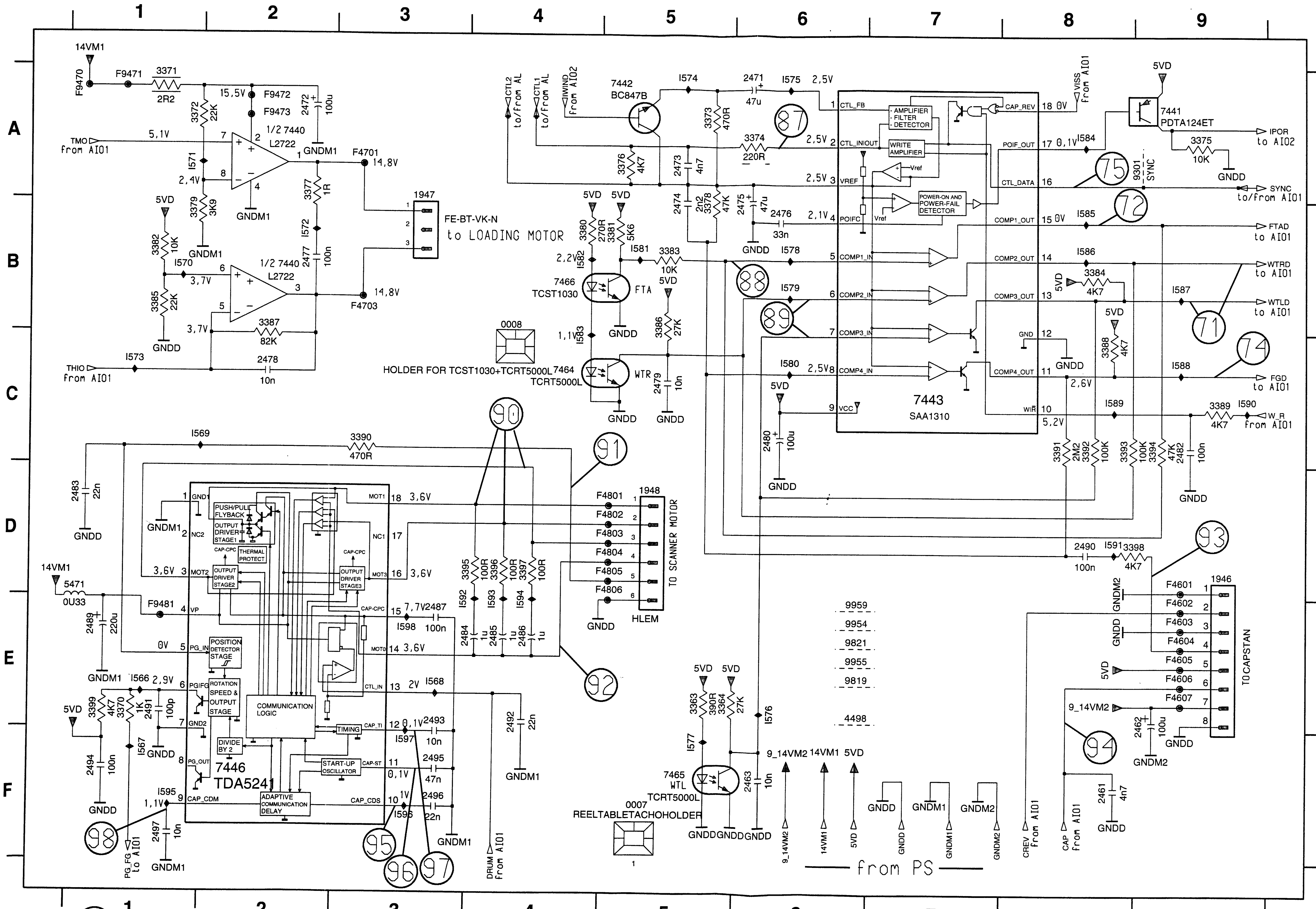
I555	E7
I556	F7
I557	E6

Deck Electronics (DE)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8
9
A
B
C
D
E
F
14VM1
F9470
F9471
3371
2R2
15,5V
F9472
F9473
2472
100u
3372
22K
1/2 7440
L2722
TMO
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5,1V
1571
2,4V
GNDM1
F4701
14,8V
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1R
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FE-BT-VK-N
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3382
10K
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3387
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TCRT5000L
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27K
2479
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I580
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Vref
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COMP2_IN
COMP3_IN
COMP4_IN
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7443
SAA1310
CAP_REV
POIF_OUT
CTL_DATA
COMP1_OUT
COMP2_OUT
COMP3_OUT
GND
COMP4_OUT
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18 0V
17 0,1V
15 0V
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PDTA124ET
IPOR to AI02
I584
3375
10K
9301 SYNC
SYNC to/from AI01
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FTAD to AI01
I586
3384
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WTRD to AI01
I587
WTLD to AI01
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4K7
I588
FGD to AI01
I589
3389
4K7
I590
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2480
100u
3391
2M2
3392
100K
3393
100K
3394
47K
2482
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74
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88
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3390
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22n
90
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92
93
94
95
96
97
98
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THERMAL PROTECT
OUTPUT DRIVER STAGE2
OUTPUT DRIVER STAGE3
POSITION DETECTOR STAGE
ROTATION SPEED & OUTPUT STAGE
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TIMING
START-UP OSCILLATOR
ADAPTIVE COMMUNICATION DELAY
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NC2
MOT2
VP
PG_IN
PGIFG
GND2
PG_OUT
CAP_CDM
MOT1
NC1
MOT3
CAP-CPC
MOT0
CTL_IN
CAP_TI
CAP-ST
CAP_CDS
7446
TDA5241
18 3,6V
3,6V
16 3,6V
15 7,7V
14 3,6V
13 2V
I568
12 0,1V
I597
11 0,1V
10 1V
I596
2487
100n
I598
2493
10n
2495
47n
2496
22n
2492
22n
14VM1
5471
0U33
F9481
2489
220u
0V
GNDM1
I566
2,9V
3399
4K7
3370
1K
2491
100p
I567
2494
100n
I595
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10n
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3396
100R
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2485
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F4602
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F4604
F4605
F4606
F4607
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0008	B4
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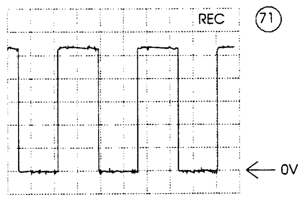
1948	D5
2461	F8
2462	E9
2463	F6
2471	A6
2472	A2
2473	A5
2474	B5
2475	B6
2476	B6
2477	B2
2478	C2
2479	C5
2480	C6
2482	C9
2483	D1
2484	E4
2485	E4
2486	E4
2487	E3
2489	E1
2490	D8
2491	E1
2492	E4
2493	E3
2494	F1
2495	F3
2496	F3
2497	F1
3363	E5
3364	E5
3370	E1
3371	A1
3372	A1
3373	A5
3374	A6
3375	A9
3376	A5
3377	A2
3378	B5
3379	B1
3380	B4
3381	B5
3382	B1
3383	B5
3384	B8
3385	B1
3386	B5
3387	B2
3388	C8
3389	C9
3390	C3
3391	C8
3392	C8
3393	C8
3394	C9
3395	D4
3396	D4
3397	D4
3398	D8
3399	E1
4498	E6
5471	D1
7440	A2
7440	B2
7441	A9
7442	A5
7443	C7
7446	F2
7464	C4
7465	F5
7466	B4
9301	A8
9819	E6
9821	E6
9954	E6
9955	E6
9959	E6
F4601	D9
F4602	E9
F4603	E9
F4604	E9
F4605	E9
F4606	E9
F4607	E9
F4701	A3
F4703	B3
F4801	D5
F4802	D5
F4803	D5
F4804	D5
F4805	D5
F4806	D5
F9470	A1
F9471	A1
F9472	A2
F9473	A2
F9481	E1
I566	E1
I567	F1
I568	E3
I569	C1
I570	B1
I571	A1
I572	B2
I573	C1
I574	A5
I575	A6
I576	E6
I577	F5
I578	B6
I579	B6
I580	C6
I581	B5
I582	B4
I583	C4
I584	A8
I585	B8
I586	B8
I587	B9
I588	C9
I589	C8
I590	C9
I591	D8
I592	E3
I593	E4
I594	E4
I595	F1
I596	F3
I597	F3
I598	E3

○ ... OSCILLOGRAMS

... V MEASURED IN PLAYBACK MODE

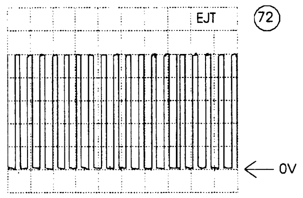
$\boxed{...}$ V MEASURED IN RECORD MODE

Oscillograms Deck Electronics



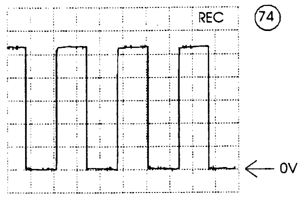
(71)

A: DC, 1 V/Div, 200ms/Div
IC 7406 Pin 6/7



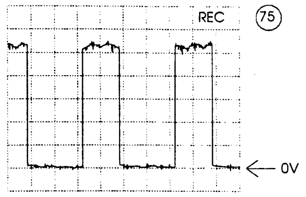
(72)

A: DC, 1 V/Div, 20ms/Div
IC 7406 Pin 3



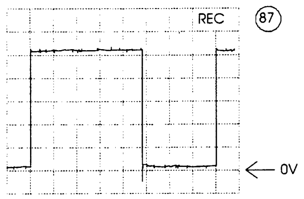
(74)

A: DC, 1 V/Div, 500us/Div
IC 7406 Pin 32



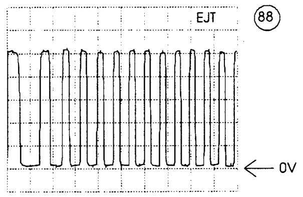
(75)

A: DC, 1 V/Div, 10ms/Div
IC 7406 Pin 27/42



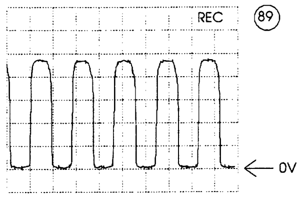
(87)

A: DC, 1 V/Div, 5ms/Div
IC 7443 Pin 2



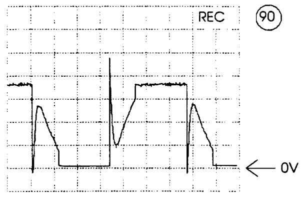
(88)

A: DC, 1 V/Div, 20ms/Div
IC 7443 Pin 5



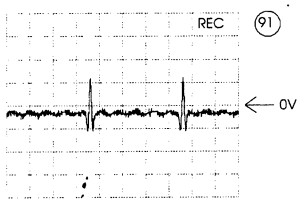
(89)

A: DC, 1 V/Div, 500ms/Div
IC 7443 Pin 6/7



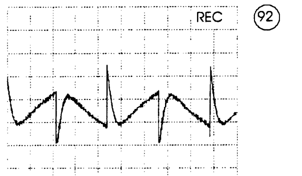
(90)

A: DC, 2 V/Div, 1ms/Div
Connector 1948 Pin 1/2/3



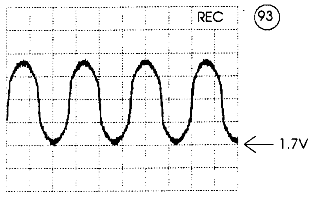
(91)

A: DC, 200mV/Div, 10ms/Div
Connector 1948 Pin 5



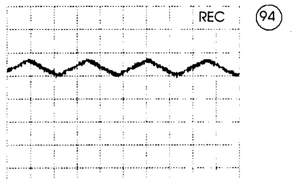
(92)

A: DC, 1 V/Div, 500us/Div
Connector 1948 Pin 4



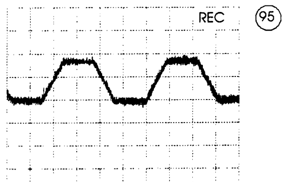
(93)

A: DC, 500mV/Div, 500us/Div
Connector 1946 Pin 4



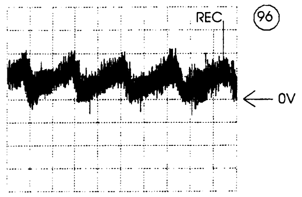
(94)

A: DC, 500mV/Div, 10us/Div
Connector 1946 Pin 6



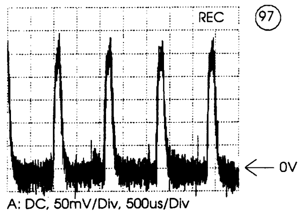
(95)

A: DC, 200mV/Div, 500us/Div
IC 7446 Pin 10



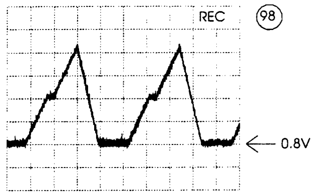
(96)

A: DC, 50mV/Div, 500us/Div
IC 7446 Pin 11



(97)

A: DC, 50mV/Div, 500us/Div
IC 7446 Pin 12



(98)

A: AC, 200mV/Div, 500us/Div
IC 7446 Pin 9

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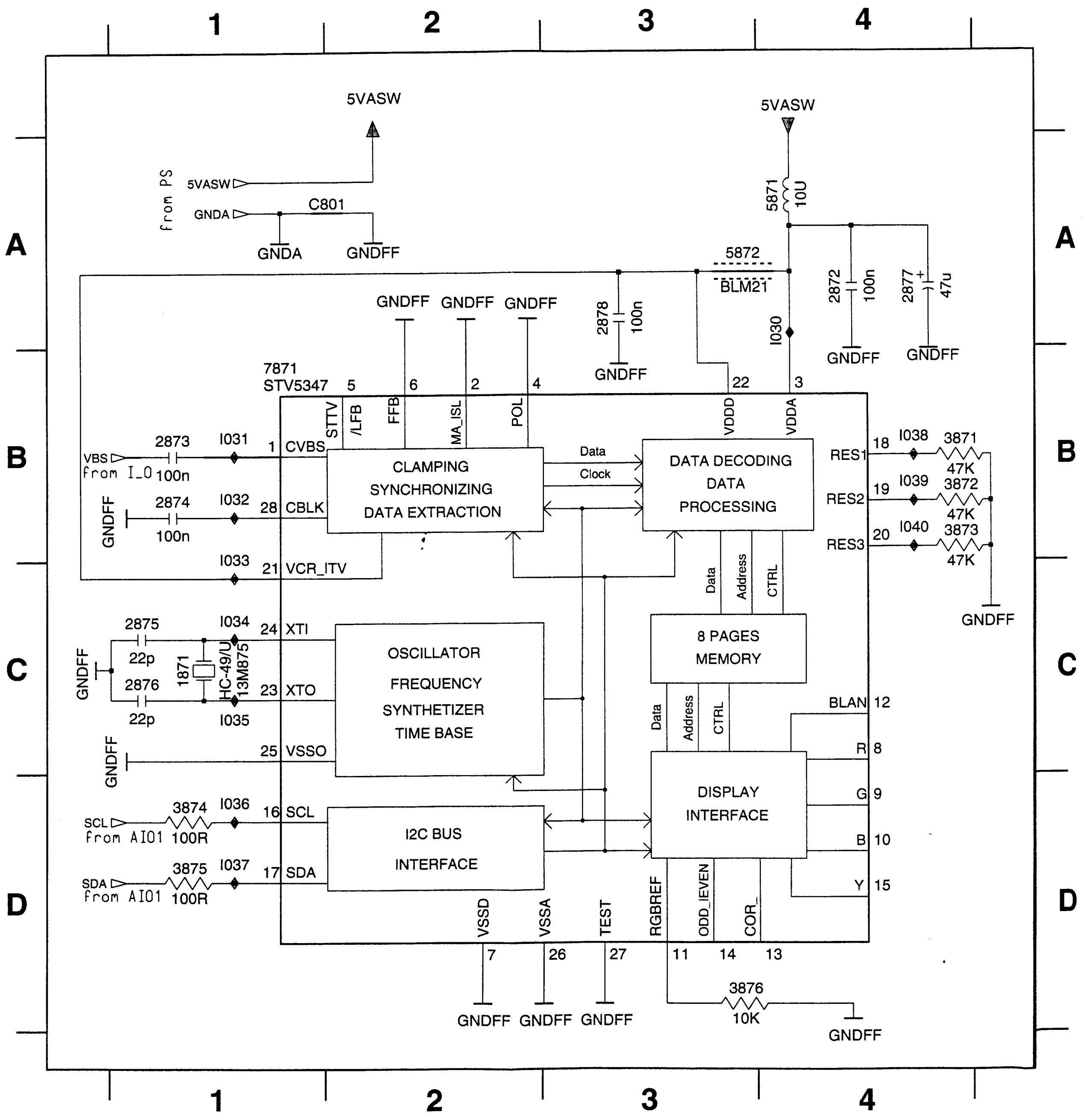
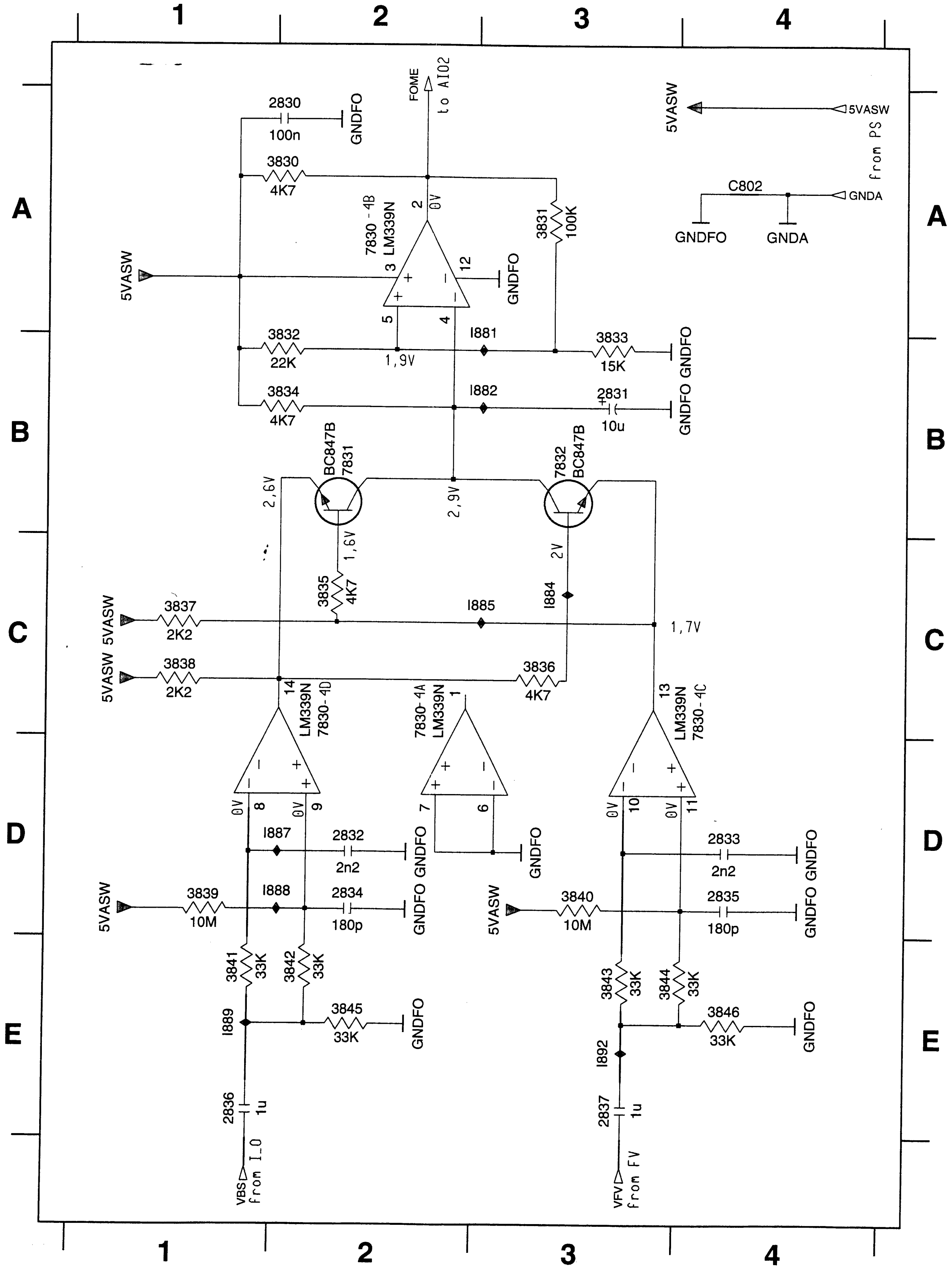
Text Data Slicer (FF)

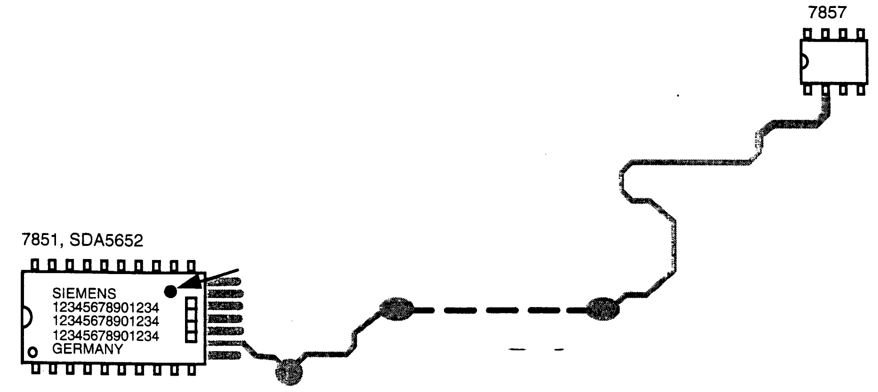
1871	C1
2872	A4
2873	B1
2874	B1
2875	C1
2876	C1
2877	A4
2878	A3
3871	B4
3872	B4
3873	B4
3874	D1
3875	D1
3876	D3
5871	A4
5872	A3
7871	B1
C801	A2
I030	A4
I031	B1
I032	B1
I033	B1
I034	C1
I035	C1
I036	D1
I037	D1
I038	B4
I039	B4
I040	B4


1
2
3
4
A
B
C
D
from PS
5VASW
GNDA
C801
GNDA
GNDFF
5VASW
5871
10U
5872
BLM21
2872
100n
2877
47u
2878
100n
I030
GNDFF
7871
STV5347
STTV
/LFB
FFB
MA_ISL
POL
VDDD
VDDA
VBS
from I_O
2873
100n
I031
CVBS
2874
100n
I032
CBLK
I033
VCR_ITV
CLAMPING
SYNCHRONIZING
DATA EXTRACTION
Data
Clock
DATA DECODING
DATA
PROCESSING
RES1
RES2
RES3
I038
3871
47K
I039
3872
47K
I040
3873
47K
Address
CTRL
8 PAGES
MEMORY
2875
22p
2876
22p
1871
HC-49/U
13M875
I034
XTI
I035
XTO
VSSO
OSCILLATOR
FREQUENCY
SYNTHETIZER
TIME BASE
BLAN
R
G
B
Y
DISPLAY
INTERFACE
SCL
from AI01
3874
100R
I036
SDA
from AI01
3875
100R
I037
I2C BUS
INTERFACE
VSSD
VSSA
TEST
RGBREF
ODD_IEVEN
COR_
3876
10K

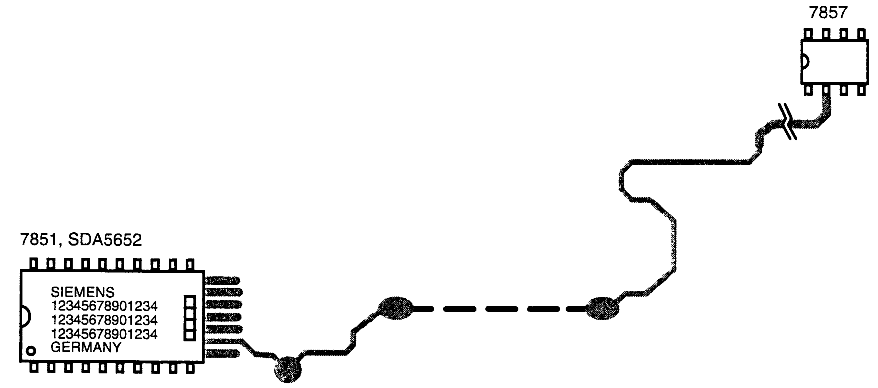
Follow Me Part (FOME)

2830 A2
2831 B3
2832 D2
2833 D4
2834 D2
2835 D4
2836 E1
2837 E3
3830 A2
3831 A3
3832 B2
3833 B3
3834 B2
3835 C2
3836 C3
3837 C1
3838 C1
3839 D1
3840 D3
3841 E1
3842 E2
3843 E3
3844 E3
3845 E2
3846 E4
7830 A2
7830 D2
7830 D2
7830 D4
7831 B2
7832 B3
C802 A4
I881 A3
I882 B3
I884 C3
I885 C3
I887 D2
I888 D2
I889 E1
I892 E3


1
2
3
4
A
B
C
D
E
FOME
to AI02
2830
100n
GNDFO
3830
4K7
5VASW
from PS
C802
GNDA
GNDFO
7830-4B
LM339N
3831
100K
0V
12
5
4
1881
3832
22K
1,9V
3833
15K
3834
4K7
1882
2831
10u
BC847B
7831
7832
2,6V
2,9V
1,6V
2V
3835
4K7
1885
1884
3837
2K2
3838
2K2
1,7V
3836
4K7
7830-4D
7830-4A
7830-4C
LM339N
14
13
8
9
7
6
10
11
1887
2832
2n2
1888
2834
180p
3839
10M
3840
10M
2833
2n2
2835
180p
3841
33K
3842
33K
3845
33K
3843
33K
3844
33K
3846
33K
1889
1892
2836
1u
2837
1u
VBS
from I.O
VFV
from FV


7857
7851, SDA5652
SIEMENS
12345678901234
12345678901234
12345678901234
GERMANY

Picture 1
SDA5652 Version 1 (for OSD Version identification see also Service Test Program Step 0)


7857
7851, SDA5652
SIEMENS
12345678901234
12345678901234
12345678901234
GERMANY

Picture 2
SDA5652 Version 1 replaced by Version 2

(GB) Replacing position 7851, SDA5652

If an IC7851 identified with a dot (Version 1) as shown in picture 1 has been fitted in the set, and if a version without a dot (Version 2) is supplied as a replacement part, the following modifications have to be done:

- The circuit board conductor from pin 2 on 7857 to pin 7 on 7851 must be interrupted, as in picture 2.

(D) Tausch von Position 7851, SDA5652

Wenn im Gerät ein IC7851 mit Punkt als Kennzeichnung (Version 1) wie in Bild 1 eingebaut ist und als Ersatzteil erhält man eine Version ohne Punkt (Version 2), sind folgende Modifikationen notwendig:

- Leiterbahn von Pin 2 von 7857 zu Pin 7 von 7851 unterbrechen wie in Bild 2.

(F) Remplacement de position 7851, SDA5652

Si un CI7851 marqué d'un point (Version 1) se trouve dans l'appareil et si on vous a donné une version sans point (Version 2) comme pièce de rechange, les modifications suivantes doivent être apportées:

- interrompre la piste reliant la broche 2 du 7857 à la broche 7 du 7851 comme indiqué en figure 2.

(NL) Wisselen van positie 7851, SDA5652

Als er in het toestel een IC7851 met een punt als kenmerk (Version 1) zoals in afb. 1 ingebouwd is en als reserveonderdeel krijgt u een versie zonder punt (Version 2), moeten volgende modificaties worden uitgevoerd:

- printbaan van pin 2 van 7857 naar pin 7 van 7851 onderbreken zoals op afb. 2

(E) Sostituzione di pos. 7851, SDA5652

Se nell'apparecchio è presente un IC7851 contrassegnato da un punto (Version 1), come raffigurato in figura 1, ed in sostituzione si riceve una versione priva del punto (Version 2), occorre apportare le seguenti modifiche:

- interrompere il collegamento dal pin 2 di 7857 al pin 7 di 7851, come in figura 2.

(I) Cambio de pos. 7851, SDA5652

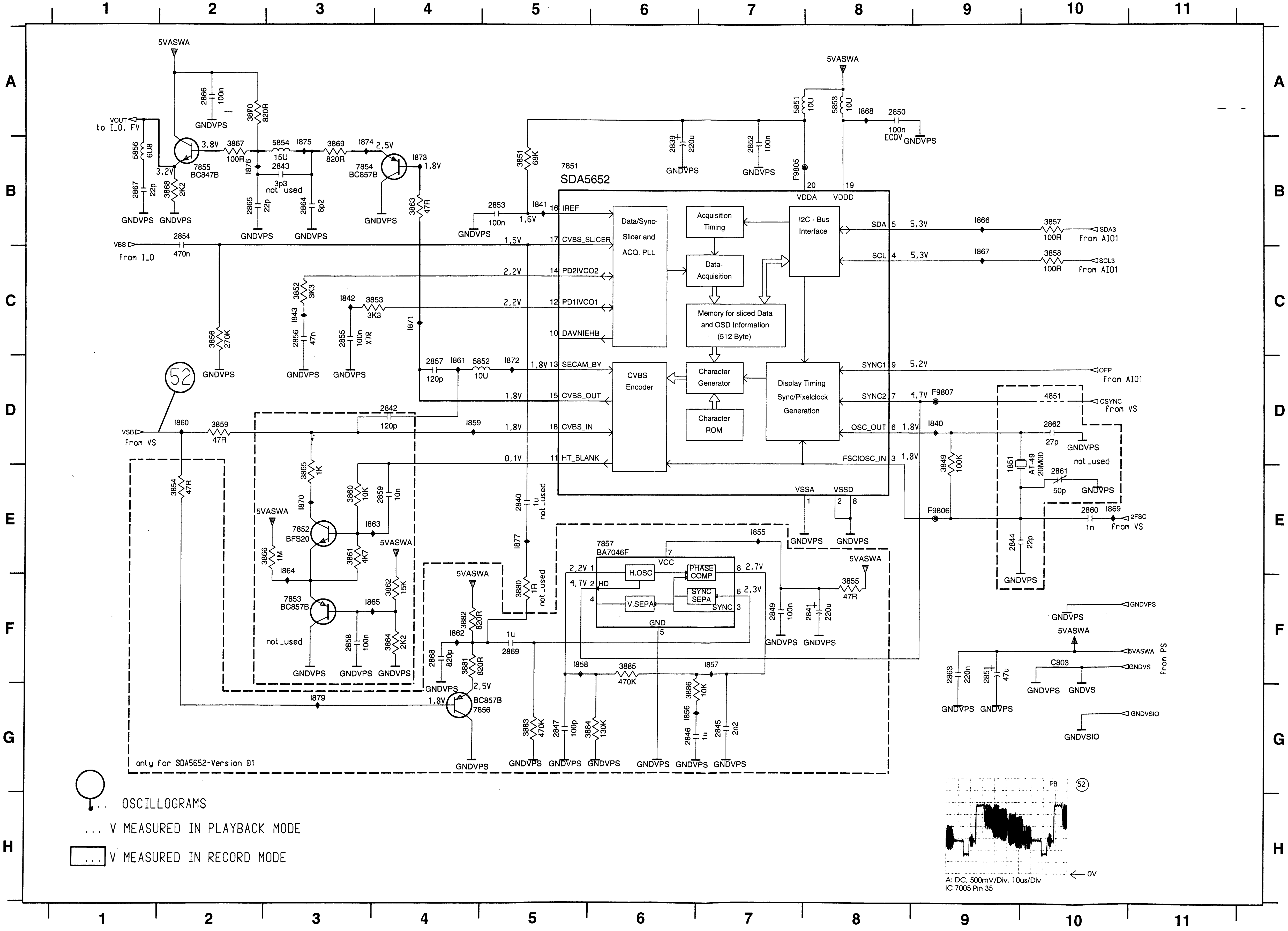
Si está instalado en el equipo un CI 7851 con un punto como identificación (Version 1), segun la Fig.1 , y la pieza de recambio suministrada es una versión sin punto (Version 2), es necesario efectuar las siguientes modificaciones:

- interrumpir el conductor impreso de pin 2 de 7857 a Pin 7 de 7851 según muestra Fig. 2.

VPS/PDC & OSD Part (VPO)

Interconnections Manual Page

AF	3-26	AIO2	3-41	CNR	3-36	DE	3-42	FF	3-43	FOME	3-44	HA	3-32	PE	3-40	QNIC	3-46	VS	3-31
AIO1	3-38	AL	3-28	DC	3-48	ER	3-27	FM_STEREO	3-25	FV	3-24	I_O	3-37	PS	3-22	VPO	3-45	VS_SEC	3-35



1 2 3 4 5 6 7 8 9 10 11
A B C D E F G H
5VASWA
VOUT to I_O, FV
VBS from I_O
VSB from VS
7855 BC847B
7854 BC857B
7852 BFS20
7853 BC857B
7856 BC857B
7851 SDA5652
7857 BA7046F
IREF
CVBS_SLICER
PD2IVCO2
PD1IVCO1
DAVNIEHB
SECAM_BY
CVBS_OUT
CVBS_IN
HT_BLANK
VDDA
VDDD
VSSA
VSSD
SDA
SCL
SYNC1
SYNC2
OSC_OUT
FSCIOSC_IN
Data/Sync-Slicer and ACQ. PLL
Acquisition Timing
Data-Acquisition
Memory for sliced Data and OSD Information (512 Byte)
Character Generator
Character ROM
CVBS Encoder
I2C - Bus Interface
Display Timing Sync/Pixelclock Generation
H.OSC
PHASE COMP
SYNC SEPA
V.SEPA
VCC
HD
SYNC
GND
SDA3 from AIO1
SCL3 from AIO1
OFP from AIO1
CSYNC from VS
2FSC from VS
AT-49 20M00
not_used
GNDVPS
GNDVS
GNDVSIO
from PS
only for SDA5652-Version 01
52
A: DC, 500mV/Div, 10us/Div
IC 7005 Pin 35
PB
0V

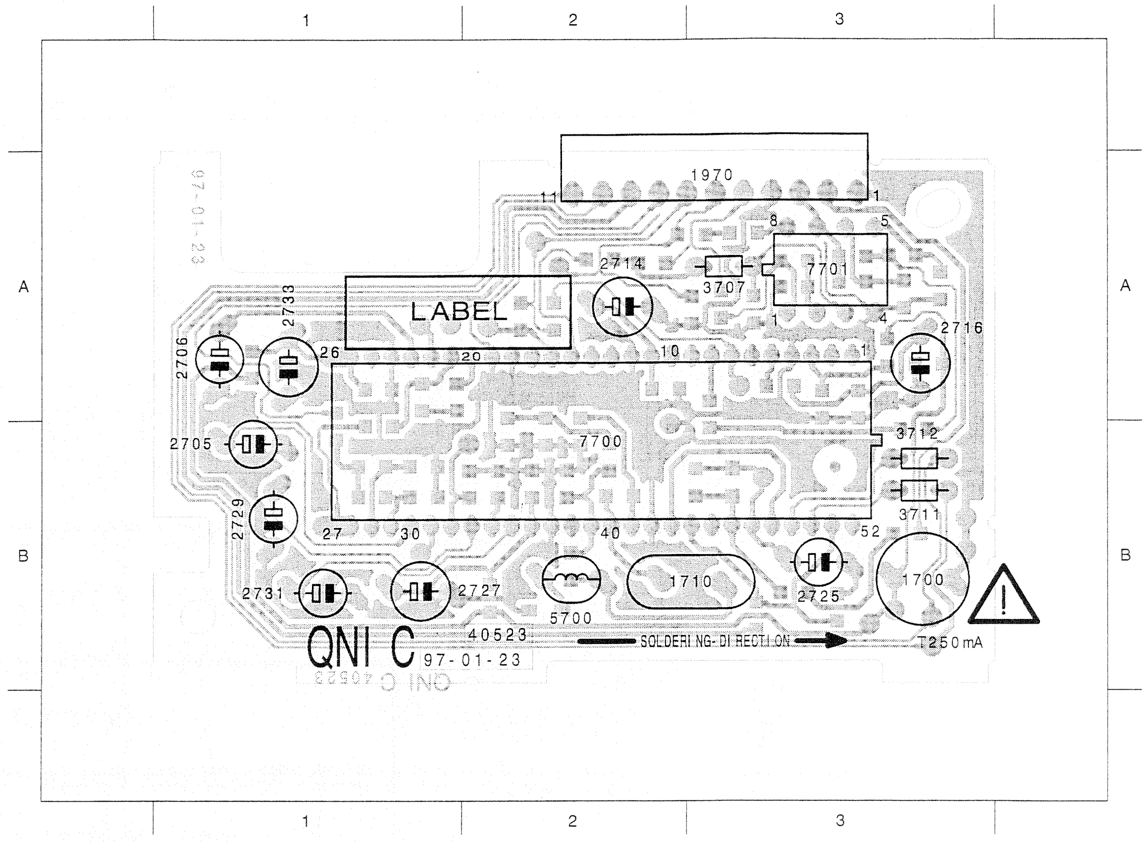
... OSCILLOGRAMS

... V MEASURED IN PLAYBACK MODE

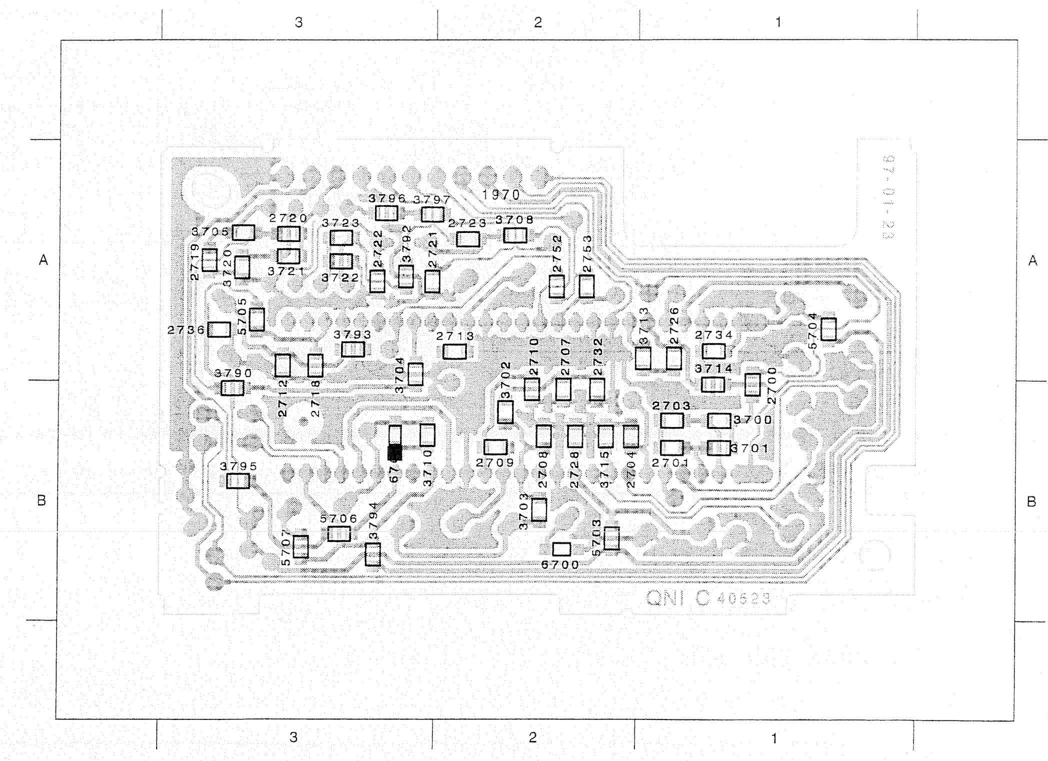
... V MEASURED IN RECORD MODE

1851	D9
2839	B6
2840	E5
2841	F8
2842	D4
2843	B3
2844	E9
2845	G7
2846	G6
2847	G5
2849	F7
2850	A8
2851	F9
2852	B7
2853	B5
2854	B2
2855	C3
2856	C3
2857	D4
2858	F3
2859	E4
2860	E10
2861	E10
2862	D10
2863	F9
2864	B3
2865	B2
2866	A2
2867	B1
2868	F4
2869	F5
3849	D9
3851	B5
3852	C3
3853	C3
3854	E2
3855	F8
3856	C2
3857	B10
3858	C10
3859	D2
3860	E3
3861	E3
3862	F4
3863	B4
3864	F4
3865	E3
3866	E3
3867	B2
3868	B2
3869	B3
3870	A2
3880	F5
3881	F4
3882	F4
3883	G5
3884	G6
3885	F6
3886	G6
4851	D10
5851	A7
5852	D4
5853	A8
5854	B3
5856	B1
7851	B5
7852	E3
7853	F3
7854	B3
7855	B2
7856	G4
7857	E6
C803	F10
F9805	B7
F9806	E9
F9807	D9
1840	D9
1841	B5
1842	C3
1843	C3
1855	E7
1856	G6
1857	F7
1858	F5
1859	D4
1860	D2
1861	D4
1862	F4
1863	E3
1864	E3
1865	F3
1866	B9
1867	C9
1868	A8
1869	E10
1870	E3
1871	C4
1872	D5
1873	B4
1874	B3
1875	B3
1876	B2
1877	E5
1879	G3

Nicam Board (QNIC)

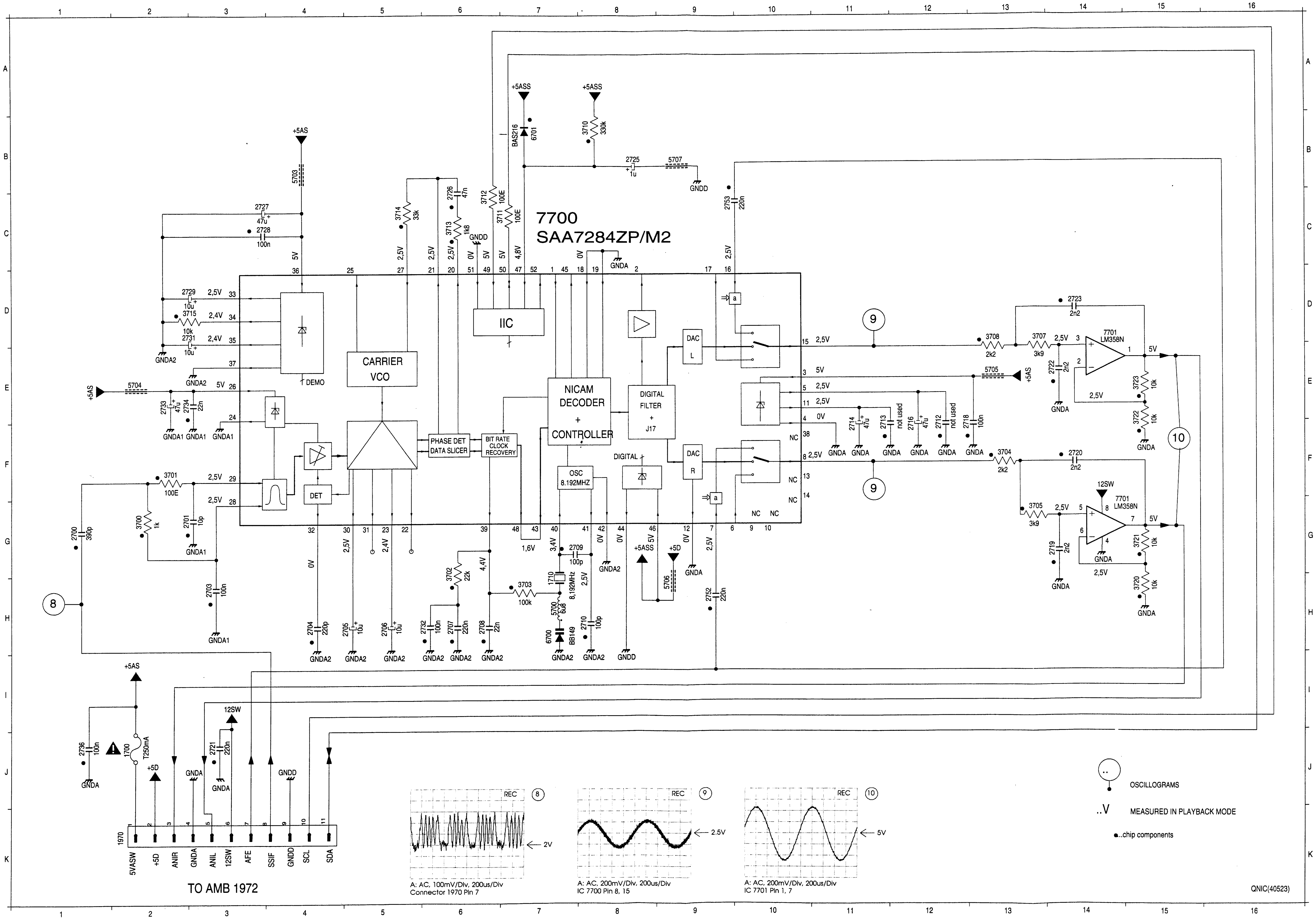

1
2
3
A
B
1970
11
1
8
5
2714
3707
7701
4
LABEL
2733
2706
26
20
10
2716
2705
7700
3712
3711
2729
27
30
40
52
2731
2727
5700
1710
2725
1700
QNI C
40523
97-01-23
SOLDERI NG- DI RECTI ON
T250mA

1700	B	3
1710	B	3
1970	A	3
2705	B	1
2706	A	1
2714	A	2
2716	A	3
2725	B	3
2727	B	1
2729	B	1
2731	B	1
2733	A	1
3707	A	3
3711	B	3
3712	B	3
5700	B	2
7700	B	2
7701	A	3


3
2
1
A
B
97-01-23
3796
3797
1970
2720
3723
2723
3708
3705
2719
3720
3721
3722
2722
3792
2721
2752
2753
2736
5705
3793
2713
3713
2726
5704
3790
2712
2718
3704
3702
2710
2707
2732
2734
3714
2700
2703
3700
3701
3795
6701
3710
2709
2708
2728
3715
2704
2701
5706
3794
5707
3703
6700
5703
QNI C 40523

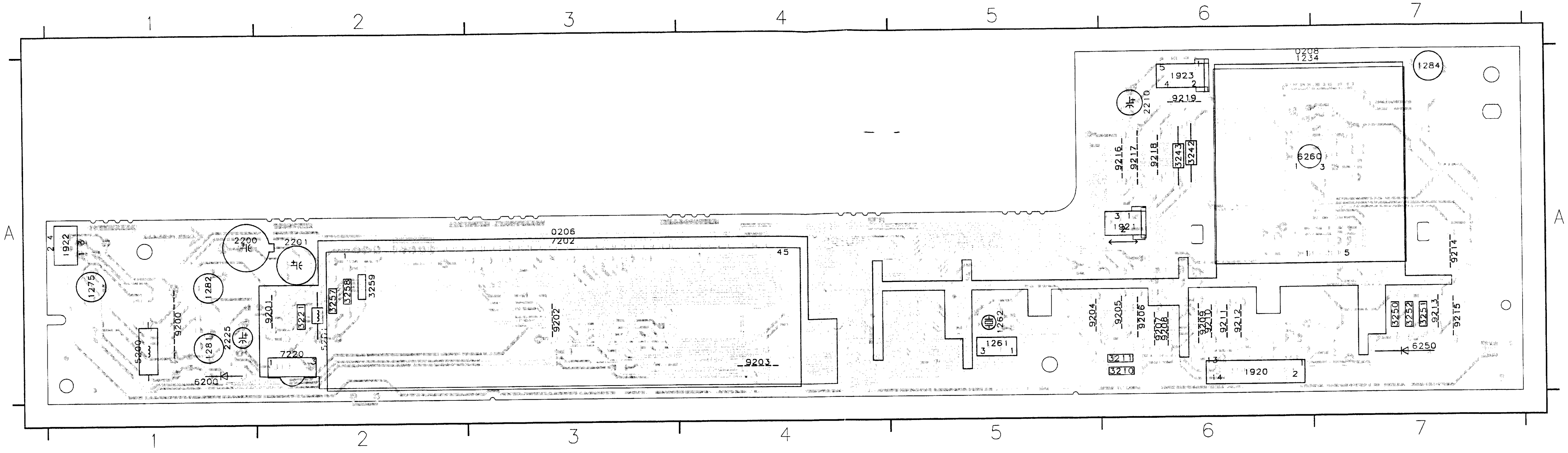
2700	B	1
2701	B	1
2703	B	1
2704	B	2
2707	B	2
2708	B	2
2709	B	2
2710	B	2
2712	A	3
2713	A	2
2718	A	3
2719	A	3
2720	A	3
2721	A	3
2722	A	3
2723	A	2
2726	A	1
2728	B	2
2732	B	2
2734	A	1
2736	A	3
2752	A	2
2753	A	2
3700	B	1
3701	B	1
3702	B	2
3703	B	2
3704	A	3
3705	A	3
3708	A	2
3710	B	3
3713	A	1
3714	B	1
3715	B	2
3720	A	3
3721	A	3
3722	A	3
3723	A	3
3790	B	3
3792	A	3
3793	A	3
3794	B	3
3795	B	3
3796	A	3
3797	A	3
5703	B	2
5704	A	1
5705	A	3
5706	B	3
5707	B	3
6700	B	2
6701	B	3

Nicam Board (QNIC)

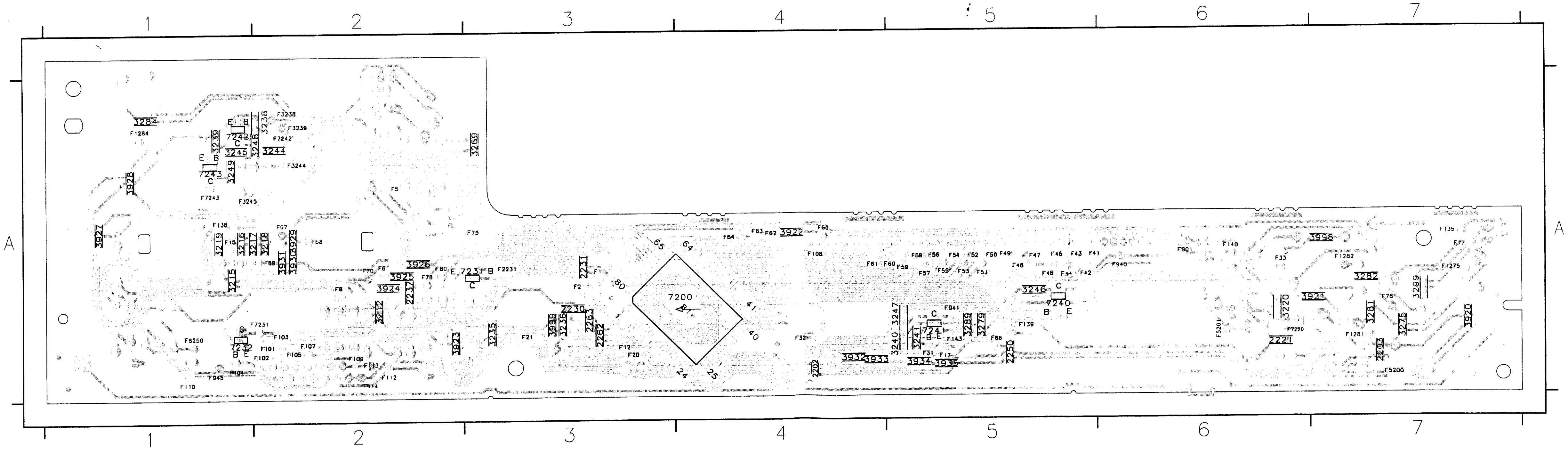

7700
SAA7284ZP/M2
IIC
CARRIER VCO
NICAM DECODER + CONTROLLER
DIGITAL FILTER + J17
PHASE DET DATA SLICER
BIT RATE CLOCK RECOVERY
OSC 8.192MHZ
DET
DEMO
DAC L
DAC R
DIGITAL
7701 LM358N
+5AS
+5ASS
+5D
12SW
GNDA
GNDA1
GNDA2
GNDD
1700 T250mA
1710 8,192MHz
6700 BB149
6701 BAS216
5700 6µ8
1970
5VASW
+5D
ANIR
GNDA
ANIL
12SW
AFE
SSIF
GNDD
SCL
SDA
TO AMB 1972
REC
A: AC, 100mV/Div, 200us/Div
Connector 1970 Pin 7
A: AC, 200mV/Div, 200us/Div
IC 7700 Pin 8, 15
A: AC, 200mV/Div, 200us/Div
IC 7701 Pin 1, 7
2V
2.5V
5V
OSCILLOGRAMS
..V MEASURED IN PLAYBACK MODE
●..chip components
QNIC(40523)

1700	J 2
1710	H 7
1970	K 2
2700	G 1
2701	G 2
2703	H 3
2704	H 4
2705	H 5
2706	H 5
2707	H 6
2708	H 6
2709	G 7
2710	H 8
2712	F12
2713	F11
2714	F11
2716	F12
2718	F12
2719	G14
2720	F14
2721	J 3
2722	E14
2723	D14
2725	B 8
2726	C 6
2727	C 3
2728	C 3
2729	D 2
2731	D 2
2732	H 6
2733	E 2
2734	E 2
2736	J 1
2752	H 9
2753	C 9
3700	G 2
3701	F 2
3702	G 6
3703	H 7
3704	F13
3705	G13
3707	D13
3708	D13
3710	B 8
3711	C 7
3712	C 6
3713	C 6
3714	C 5
3715	D 3
3720	H15
3721	G15
3722	E15
3723	E15
5700	H 7
5703	B 4
5704	E 2
5705	E13
5706	H 9
5707	B 9
6700	H 7
6701	B 7
7700	C 7
7701	D14
7701	G14

Display Control ADCP3 (DC)

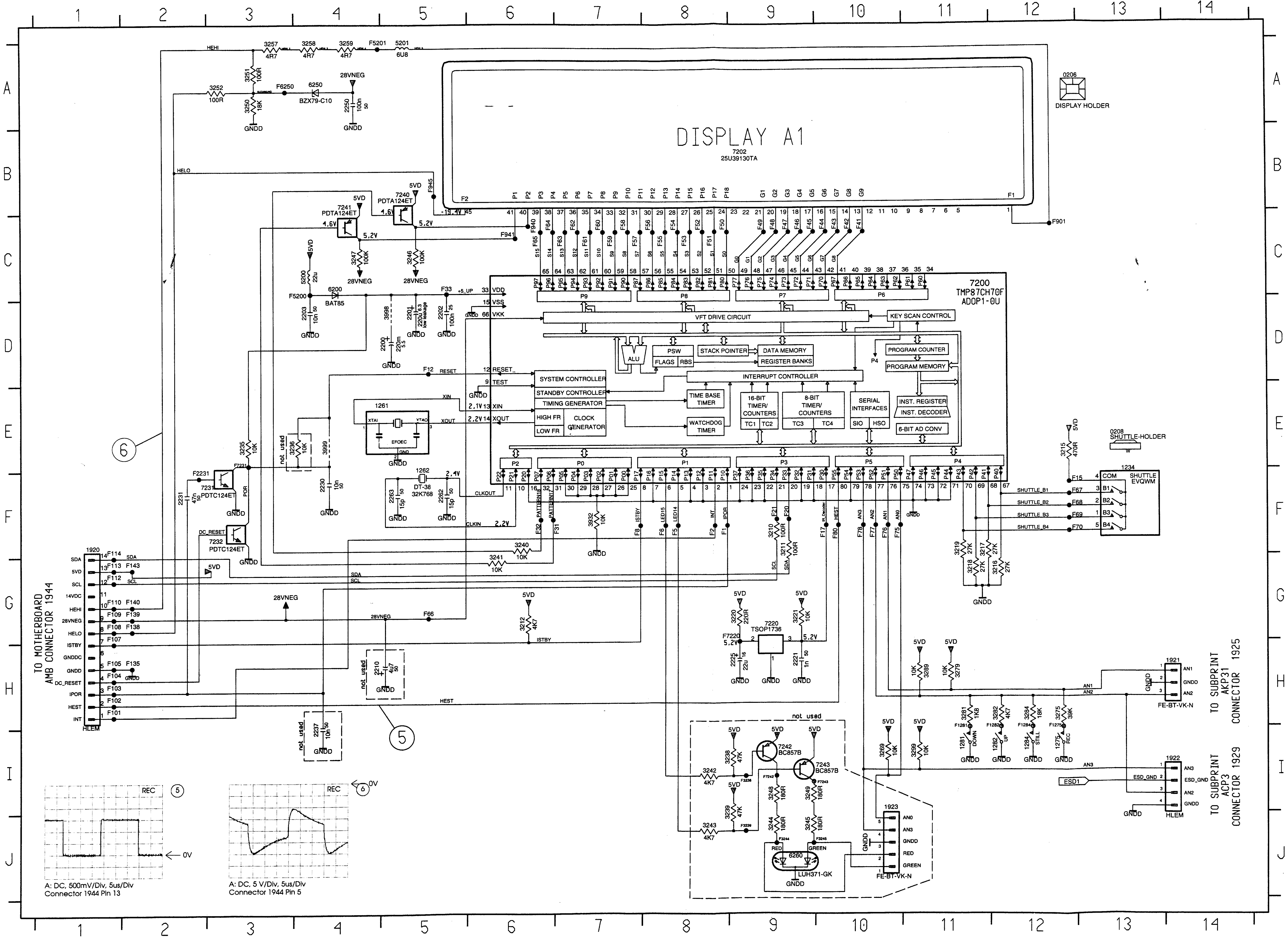

1
2
3
4
5
6
7
A
0208
1234
1923
1284
2210
9219
9216
9217
9218
3243
3242
6260
1921
9214
9215
0206
7202
45
1922
2200
2201
1275
1282
1281
5200
9200
2225
6200
9201
3221
7220
3257
3258
3259
9202
9203
1262
1261
9204
9205
9206
9207
9208
9209
9210
9211
9212
3211
3210
1920
3250
3252
3251
9213
6250

0206	A3
0208	A6
1234	A6
1261	A5
1262	A5
1275	A1
1281	A1
1282	A1
1284	A7
1920	A6
1921	A6
1922	A1
1923	A6
2200	A1
2201	A2
2210	A6
2225	A1
3210	A6
3211	A6
3221	A2
3242	A6
3243	A6
3250	A7
3251	A7
3252	A7
3257	A2
3258	A2
3259	A2
5200	A1
5201	A2
6200	A1
6250	A7
6260	A6
7202	A3
7220	A2
9200	A1
9201	A2
9202	A3
9203	A4
9204	A5
9205	A6
9206	A6
9207	A6
9208	A6
9209	A6
9210	A6
9211	A6
9212	A6
9213	A7
9214	A7
9215	A7
9216	A6
9217	A6
9218	A6
9219	A6


1
2
3
4
5
6
7
A
3284
3239
3236
3245
3244
3249
7243
7242
3928
3927
3219
3216
3217
3218
3215
3931
3930
3929
3926
3925
3924
2237
7231
3212
7232
3923
3235
3999
3236
2230
2231
2263
2262
7200
3922
2202
3932
3933
3240
3247
7241
3289
3279
3934
3935
2250
3246
7240
3998
3282
3220
3921
2221
3281
3275
3299
2203
3920

2202	A4
2203	A7
2221	A6
2230	A3
2231	A3
2237	A2
2250	A5
2262	A3
2263	A3
3212	A2
3215	A1
3216	A1
3217	A1
3218	A2
3219	A1
3220	A6
3235	A3
3236	A3
3238	A2
3239	A1
3240	A5
3241	A5
3244	A2
3245	A1
3246	A5
3247	A5
3248	A2
3249	A1
3269	A3
3275	A7
3279	A5
3281	A7
3282	A7
3284	A1
3289	A5
3299	A7
3920	A7
3921	A7
3922	A4
3923	A2
3924	A2
3925	A2
3926	A2
3927	A1
3928	A1
3929	A2
3930	A2
3931	A2
3999	A3
7200	A4
7231	A3
7232	A1
7240	A5
7241	A5
7242	A1
7243	A1

Display Control ADCP3 (DC)


DISPLAY A1
7202
25U39130TA
0206
DISPLAY HOLDER
7200
TMP87CH70F
ADOP1-0U
VFT DRIVE CIRCUIT
KEY SCAN CONTROL
ALU
PSW
FLAGS
RBS
STACK POINTER
DATA MEMORY
REGISTER BANKS
PROGRAM COUNTER
PROGRAM MEMORY
INTERRUPT CONTROLLER
SYSTEM CONTROLLER
STANDBY CONTROLLER
TIMING GENERATOR
HIGH FR
LOW FR
CLOCK GENERATOR
TIME BASE TIMER
WATCHDOG TIMER
16-BIT TIMER/ COUNTERS
TC1
TC2
8-BIT TIMER/ COUNTERS
TC3
TC4
SERIAL INTERFACES
SIO
HSO
INST. REGISTER
INST. DECODER
6-BIT AD CONV
P0
P1
P2
P3
P4
P5
P6
P7
P8
P9
1261
EFOEC
1262
DT-38
32K768
7241
PDTA124ET
7240
PDTA124ET
7231
PDTC124ET
7232
PDTC124ET
6250
BZX79-C10
6200
BAT85
28VNEG
5VD
GNDD
1920
SDA
5VD
SCL
14VDC
HEHI
28VNEG
HELO
ISTBY
GNDDC
GNDD
DC_RESET
IPOR
HEST
INT
HLEM
TO MOTHERBOARD
AMB CONNECTOR 1944
1234
SHUTTLE
EVQWM
COM
0208
SHUTTLE-HOLDER
7220
TSOP1736
7242
BC857B
7243
BC857B
6260
LUH371-GK
RED
GREEN
1923
FE-BT-VK-N
not used
1921
AN1
GNDD
AN2
TO SUBPRINT
AKP31
CONNECTOR 1925
1922
AN3
ESD_GND
AN2
GNDD
ESD1
TO SUBPRINT
ACP3
CONNECTOR 1929
1281 DOWN
1282 UP
1284 STILL
1275 REC
5
6
REC
0V
A: DC, 500mV/Div, 5us/Div
Connector 1944 Pin 13
A: DC, 5 V/Div, 5us/Div
Connector 1944 Pin 5
1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J

F1	F8
F2	F8
F5	F8
F6	F8
F8	F7
F12	D5
F15	F12
F17	F10
F20	F9
F21	F9
F31	F7
F32	F6
F33	C5
F41	C10
F42	C10
F43	C10
F44	C10
F45	C9
F46	C9
F47	C9
F48	C9
F49	C9
F50	C8
F51	C8
F52	C8
F53	C8
F54	C8
F55	C8
F56	C8
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F58	C7
F59	C7
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F62	C7
F63	C7
F64	C6
F65	C6
F66	G5
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F68	F12
F69	F12
F70	F12
F75	F10
F76	F10
F77	F10
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F80	F10
0206	A12
0208	E13
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1261	E4
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1922	I13
1923	I10
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2225	H9
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3212	G6
3215	E12
3216	G12
3217	F11
3218	G11
3219	F11
3220	G9
3221	G9
3235	E3
3236	E3
3238	I8
3239	J8
3240	F6
3241	G6
3242	I8
3243	J8
3244	J9
3245	J9
3246	C5
3247	C4
3248	I9
3249	I9
3250	A3
3251	A3
3252	A3
3257	A3
3258	A4
3259	A4
3269	I10
3275	H12
3279	H11
3281	H11
3282	H12
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7232	F3
7240	B5
7241	B4
7242	I9
7243	I9
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F113	G1
F114	F1
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F139	G2
F140	G2
F143	G2
F2231	F2
F3238	I9
F3239	J9
F3244	J9
F3245	J10
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F5201	A4
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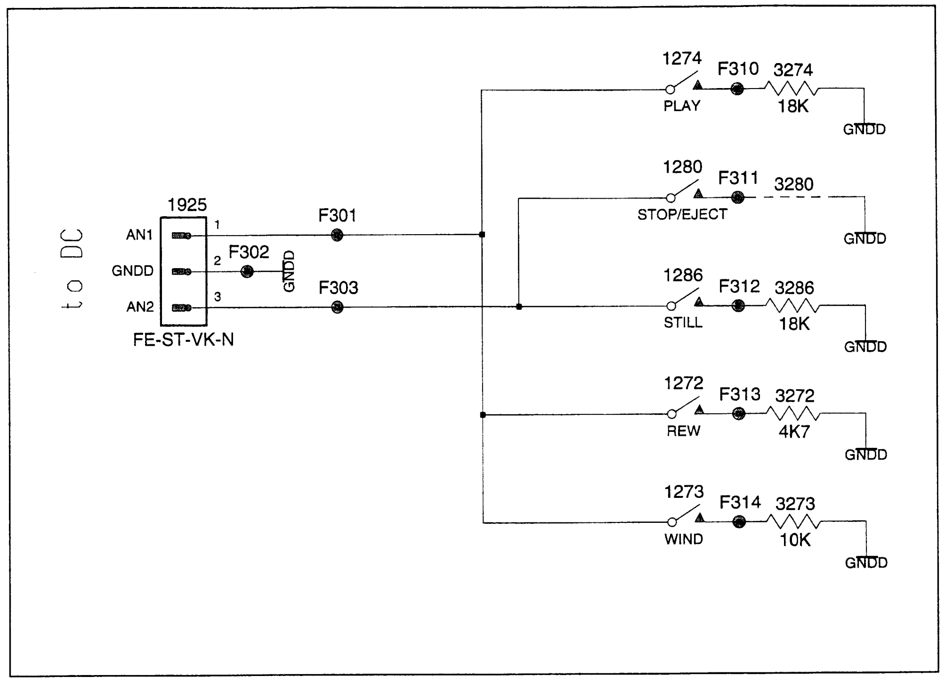
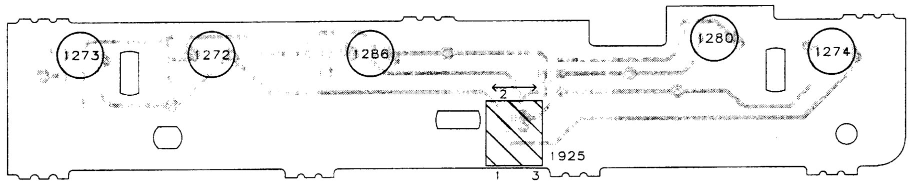
Keyboard PCB AKP31


to DC
1925
AN1
GNDD
AN2
FE-ST-VK-N
F301
F302
F303
GNDD
1274 F310 3274 18K PLAY
1280 F311 3280 STOP/EJECT
1286 F312 3286 18K STILL
1272 F313 3272 4K7 REW
1273 F314 3273 10K WIND
GNDD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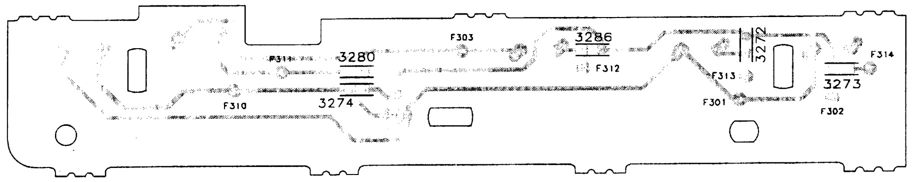
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F302

Connector PCB ACP3

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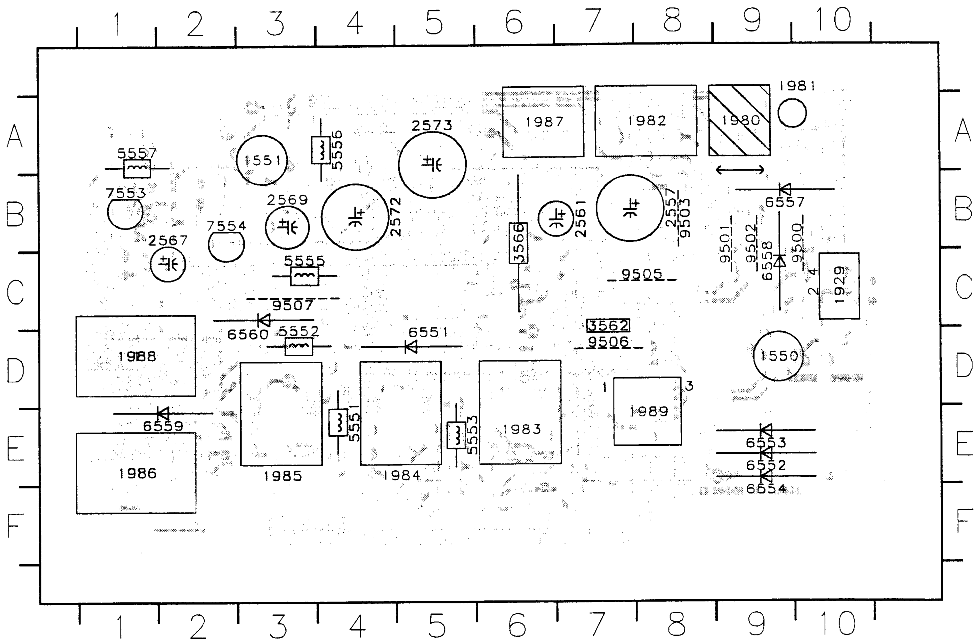
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1981
1987
1982
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7554
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1986
1985
1984

2551	E8	2559	D5	2580	E9	3554	F6	3561	E5	3570	B5	3577	E10	3584	C10	4502	C2	6555	D2
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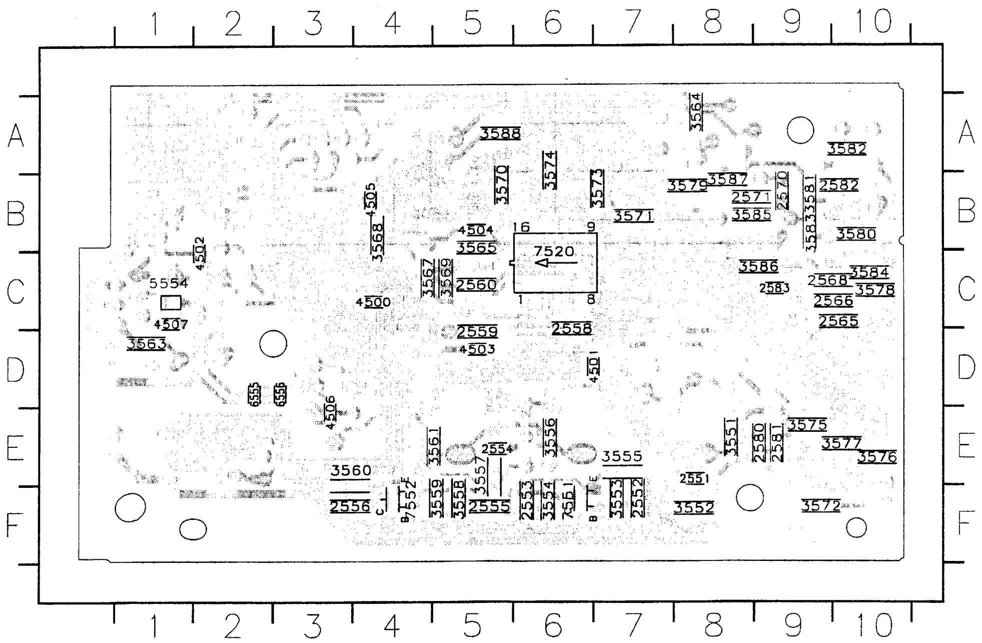
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Connector PCB ACP3

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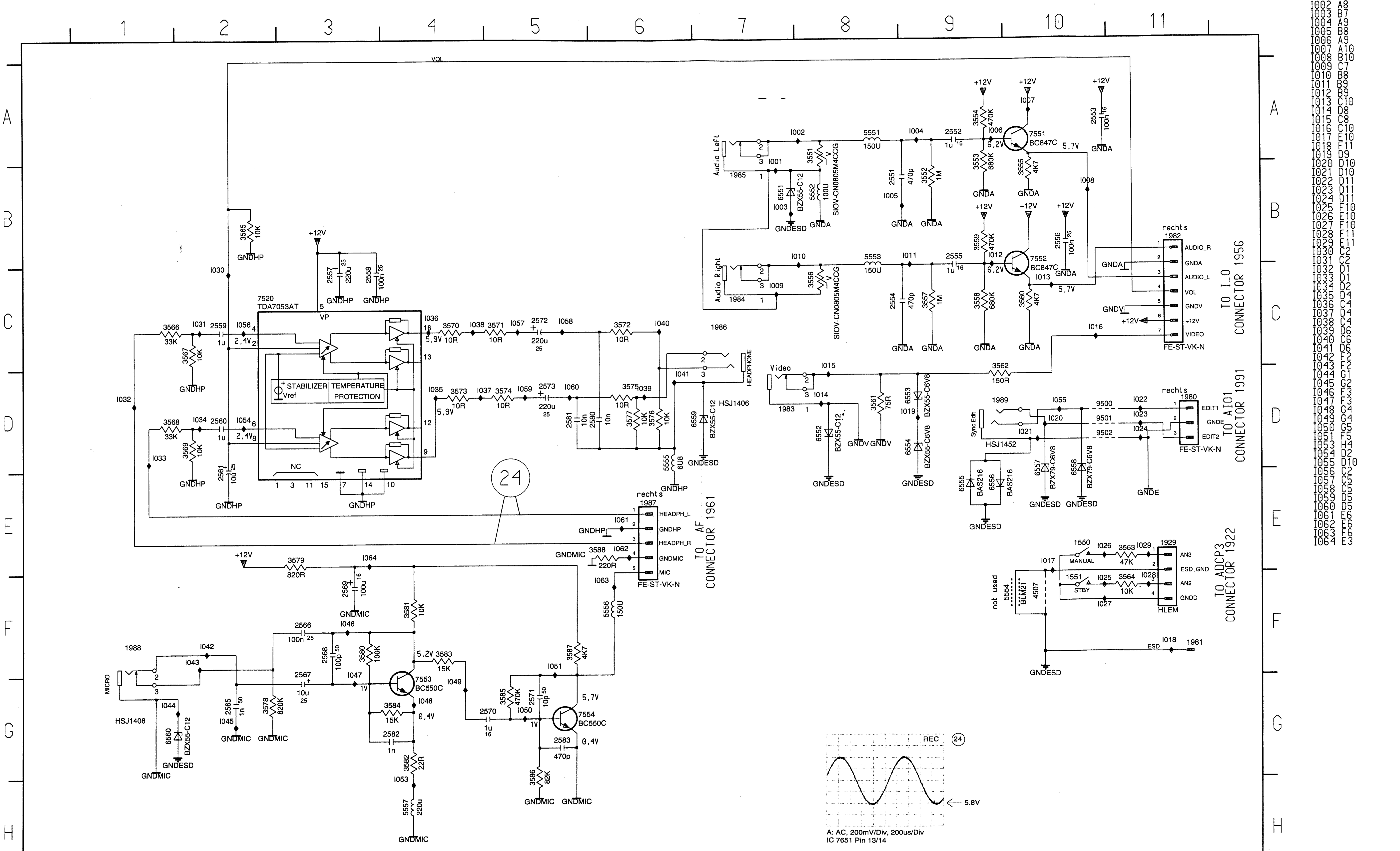
I063	F6
I064	E3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TDA7053AT
VP
STABILIZER
Vref
TEMPERATURE
PROTECTION
NC
+12V
GNDHP
GNDMIC
GNDESD
GNDA
GNDV
GNDE
Audio Left
Audio Right
Video
HEADPHONE
HSJ1406
HSJ1452
MICRO
Sync Edit
SIOV-CN0805M4CCG
7551
BC847C
7552
BC847C
7553
BC550C
7554
BC550C
6,2V
5,7V
5,9V
2,4V
5,2V
0,4V
1V
rechts
1982
AUDIO_R
GNDA
AUDIO_L
VOL
GNDV
+12V
VIDEO
FE-ST-VK-N
TO I_O CONNECTOR 1956
1980
EDIT1
GNDE
EDIT2
TO AIO1 CONNECTOR 1991
1987
HEADPH_L
GNDHP
HEADPH_R
GNDMIC
MIC
TO AF CONNECTOR 1961
1929
AN3
ESD_GND
AN2
GNDD
HLEM
TO ADCP3 CONNECTOR 1922
MANUAL
STBY
not used
5554
BLM21
4507
ESD
1981
24
REC
5.8V
A: AC, 200mV/Div, 200us/Div
IC 7651 Pin 13/14

Interconnections Manual Page

AF	3-26	AIO2	3-41	CNR	3-36	DE	3-42	FF	3-43	FOME	3-44	HA	3-32	PE	3-40	QNIC	3-46	VS	3-31
AIO1	3-38	AL	3-28	DC	3-48	ER	3-27	FM_STEREO	3-25	FV	3-24	I_O	3-37	PS	3-22	VPO	3-45	VS_SEC	3-35

PCS 93957

4. DRIVE ASSEMBLY

This tape deck has three motors; one providing precision drive for the scanner unit; the second providing direct drive for the capstan and belt drive for the reel tables; the third motor drives the lift and tape threading/dethreading operations.

Special features are:

Quick start
Short winding time
Automatic cleaning of video heads by cleaning roller

To obtain a high repair standard we have developped a range of service kit's. These kit's covers the spare parts which are engaged together.
The tape deck's sensors are located on the motherboard underneath the tape deck, and included in its circuitry, lay out and parts list.

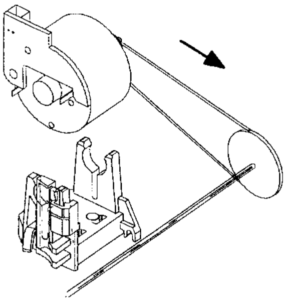
4.1 Deck parts replacement

The procedure for the removal and refitting of the following parts is described; only the lift, the scanner, the capstan motor and the A/C head are fixed by screws.
All the other deck assembly parts are held only by snap hooks.

For the replacement of parts on the underside of the tape deck, remove the tape deck from the motherboard.

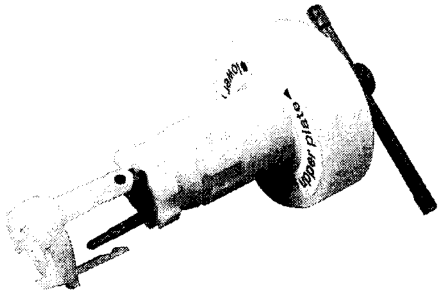
Manual extraction of cassette:
If, after the Eject button has been pressed, the drive does not unthread and eject the cassette, the dethreading/eject operation can also be carried out manually by turning the wheel at the rear of the threading motor.

fig. 1

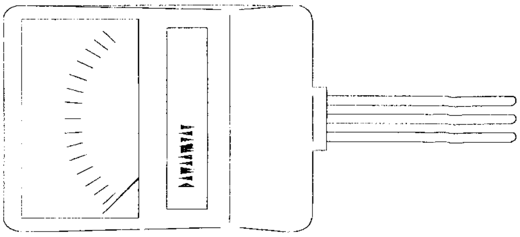


IMPORTANT:
After each repair has been carried out in the drive assembly, the first operation after repairing must be to bring the cassette compartment into „eject“ position by hand.

Auxiliary tools for deck adjustment:

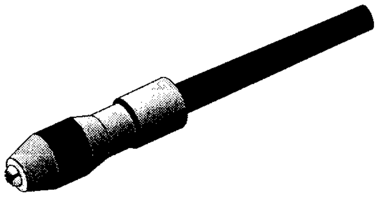


Tool for removing the head disc 4822 395 90977

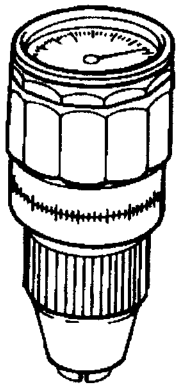


Tentelometer 4822 395 90584

Tool for tapetension adjustment 4822 395 50188

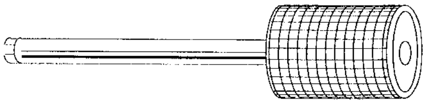


Handle 4822 256 90493



Torquemeter:

600 gf-cm 4822 395 90232
90 gf-cm 4822395 80196



Post adjustment screwdriver 4822 395 50275

Testcassette 4822 397 30103

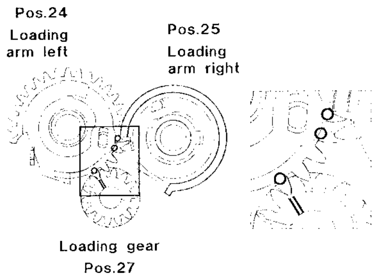
Nylon gloves 5322 395 94022

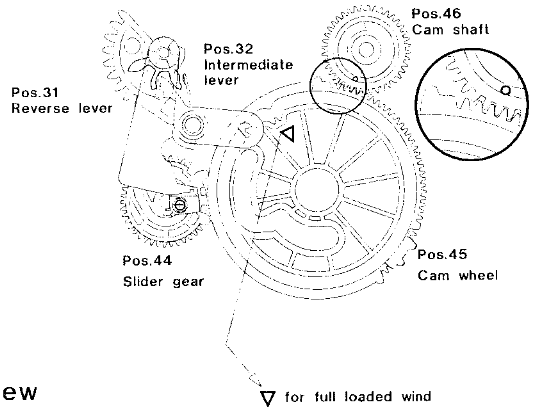
4.1.1 Deck lay out diagram

Deck in position „threaded out".

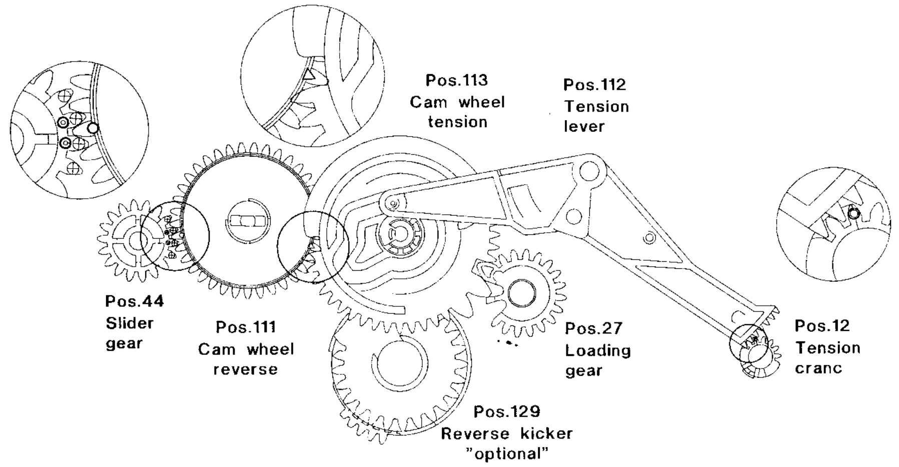
The following diagrams indicate the relative position of the gearwheels and levers when the deck is in the threaded out (cassette-compartment down) position.

Top view


Pos.24
Loading arm left
Pos.25
Loading arm right
Loading gear
Pos.27


Pos.46
Cam shaft
Pos.32
Intermediate lever
Pos.31
Reverse lever
Pos.44
Slider gear
Pos.45
Cam wheel
∇ for full loaded wind

Underside view


Pos.113
Cam wheel tension
Pos.112
Tension lever
Pos.44
Slider gear
Pos.111
Cam wheel reverse
Pos.27
Loading gear
Pos.12
Tension cranc
Pos.129
Reverse kicker
"optional"

4.1.2 The Lift

Refitting the lift compartment:
Ensure the lift compartment is down and gear A is rotated one click stop anticlockwise from the down position.
The removal and refitting of the lift can be carried out in all deck positions with the exception of „eject" (ensure that gears 103/105 are free).

To remove the lift:
Free the holding bracket (Fig. 2) by rotating it up and back from the upper end.
Unscrew the 4 screws on the underside of the deck.
Carefully remove the lift vertically, noting the position of the record protect operating lever.

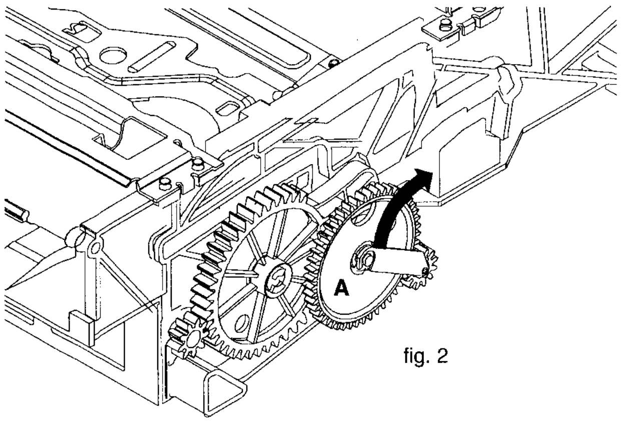


fig. 2

4.1.3 Head disc replacement

Removal :
Nylon gloves should be worn when handling the head disc.
Turn the headdisc until the long hole of the rotor appears in the bigger hole of the scannermotor
Insert the reference pin C (included with each service head disc) through the bigger hole of the lid of the scanner motor until the pin snaps in the long hole of the rotor. (Fig. 3)

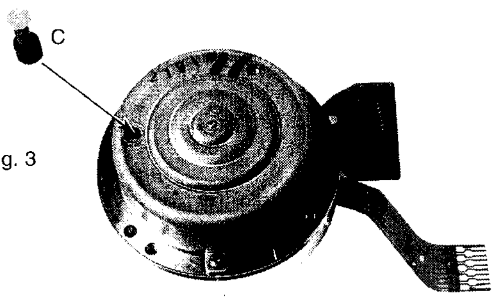


fig. 3

Important:
Choose Installation/Removal of the upper/lower clamping element by turning and attaching the reference element to the tool. (Fig. 4)

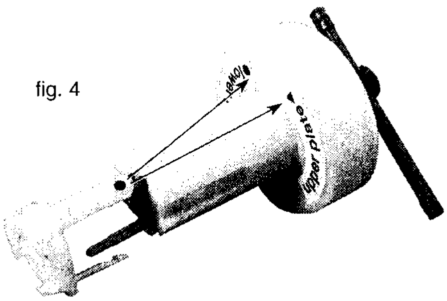

upper plate

fig. 4

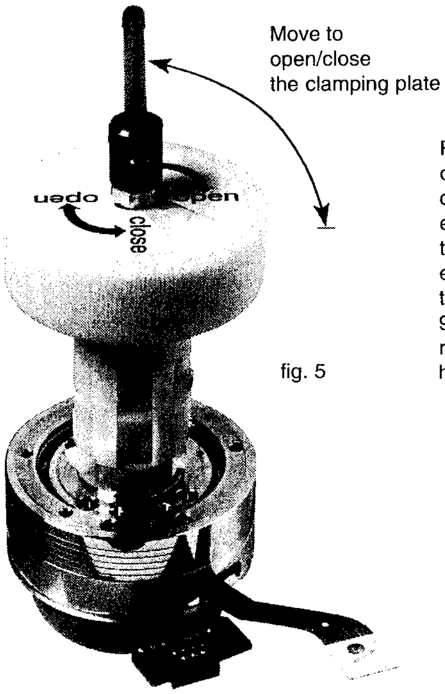


fig. 5

Position the tool on the upper clamping element, loosen the clamping element by turning the lever 90 degrees and remove it from the head disc. (Fig. 5)

Prepare the tool for the lower clamping element.Position the tool on the head disc and make sure that all 3 pins are snapped in the the lower clamping element. Loosen the clamping element by turning the lever 90 degrees and remove the head disc plus the tool from the scanner spindle. (Fig.6)

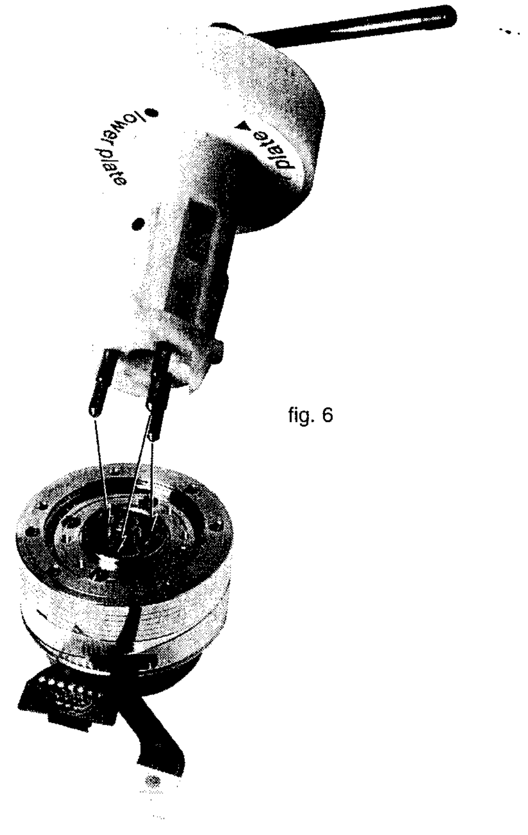


fig. 6

Installation:
Before carrying out the installation of the new head disc make sure that the scanner motor spindle is clean and undamaged. (The spindle has to be free of grease and must not be touched with bare hands)
Insert the 2 Mylar foils (included with each head disc) in the head disc. (Fig.7)

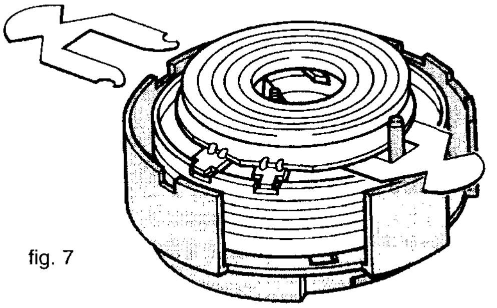


fig. 7

Position the tool (reference: lower clamping element) on the new headdisc (with protective cover) and loosen the lower clamping element.
Position the head disc so that pin D of the protective cover engages in the hole of the stator (the arrow on the protective cover must point towards the scanner print). (Fig. 8)

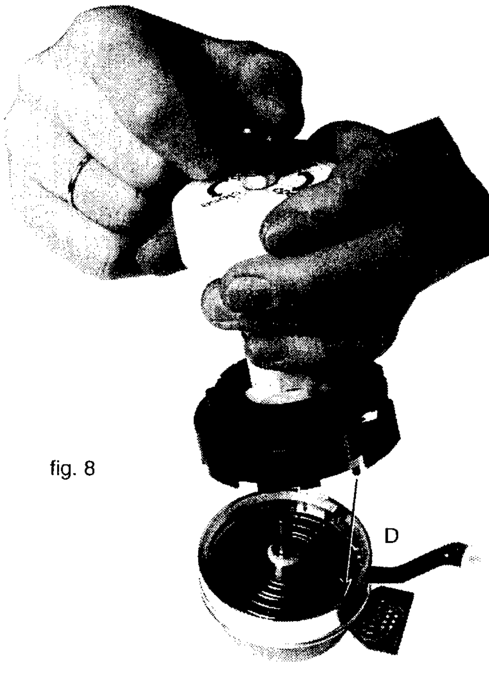


fig. 8

Reach the exact position through pressing the tool down with a force of 1 N. and fix the lower clamping element by turning the lever towards „close“.
Remove the tool.
Change the tool to „upper clamping element“ and position the clamping element exactly. (Fig. 9)

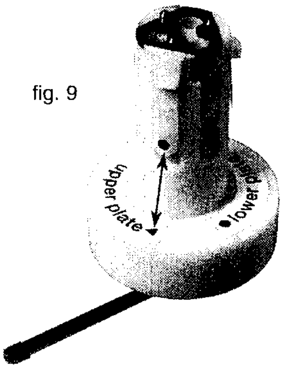


fig. 9

Tighten the clamping element through turning the lever towards „open“. Position the tool planely on the head disc and fix the clamping element. (Fig.5 „close“)
Remove the protecting cap from the head disc, withdraw the two Mylar foils and remove the reference pin C.

After replacing the head disc, carry out the following adjustments and checks :
Head switching pulse (gap position, chapter 3)
Write current adjustments (chapter 3)
Check tape path alignment (see paragraph 4.2.1.)

4.1.4 A/C Head (Combi head) (Pos. 36)

Remove the fixing spring (A) (fig. 10)
Remove the fixing screw and replace the A/C head.
Use a new fixing spring (included with new A/Chead) for reassembly.

After the A/C head has been replaced, all adjustments described in paragraph 4.2.1.2 and paragraph 4.2.2 have to be carried out.

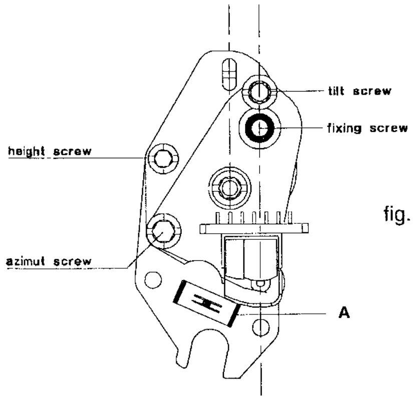


fig. 10

4.1.5 Threading motor (Pos. 38)

Remove the belt and disconnect the connector plug.
Remove the threading motor from the motor supports (Fig. 11).

During reassembly ensure that the threading motor is correctly located in the front and rear supports.

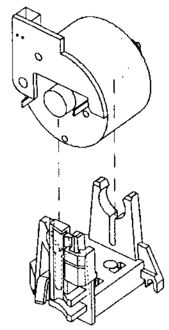


fig. 11

4.1.6 Capstan motor (Pos. 127)

Remove the tape deck.
Remove the belt (pos.126) on the underside;
Remove the three capstan motor fixing screws (Fig. 12) and withdraw the capstan motor downward from the drive assy.
The reassembly is carried out in reverse order. Make sure that the capstan is free of grease.

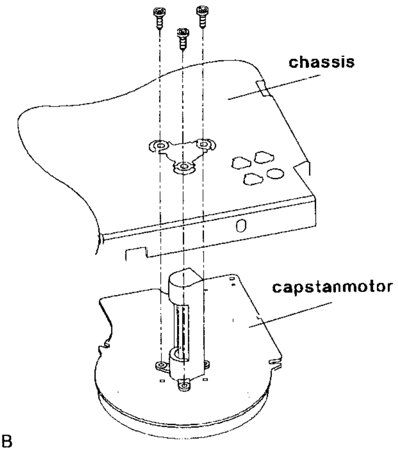


fig. 12

4.1.7 Pressure roller (Pos. 37)

Remove the tape deck
Unhook and remove the pressure roller tension spring.
Release the pressure roller guide (pos. 41) from the guide in the threading motor holder by pressing the top of the motor guide rearwards and rotating the pressure roller guide assembly clockwise by approximately a quarter of a turn (Fig. 13) The pressure roller and guide can now be lifted clear.

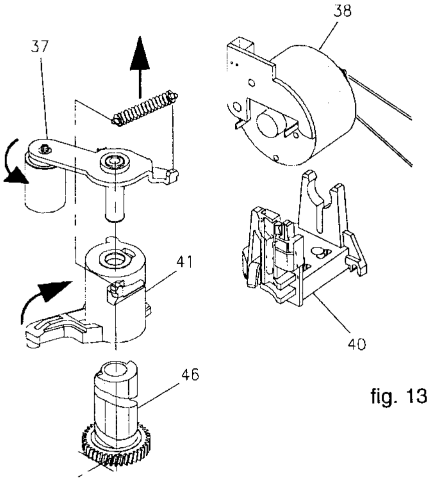
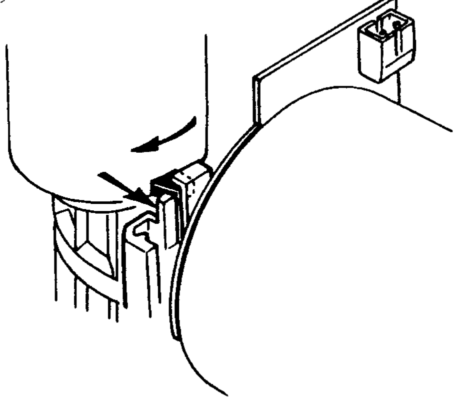


fig. 13



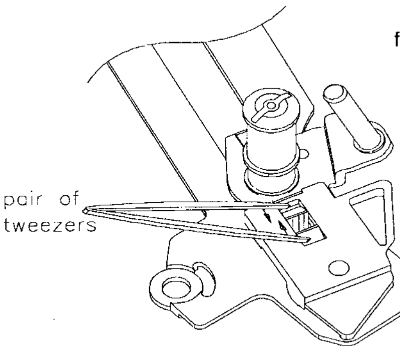
Ensure that no grease from the pressure roller guide gets to the capstan or pressure roller.
The reassembly is carried out in reverse order.

4.1.8 Roller unit right (Pos. 26)

Remove the tape deck.
Compress the two snap hooks by means of a pair of tweezers and remove the roller assy from the roller unit right (Fig. 14).
Unhinge the loading arm right from the holding plate and push the latter towards the front of the deck to remove from the guide (right).

NOTE: During reassembly ensure the link from 25 is engaged in the hole of the holder plate 26.
After replacing the roller unit (right), the tape path has to be checked, and adjusted if necessary (paragraph 4.2.1).

fig. 10



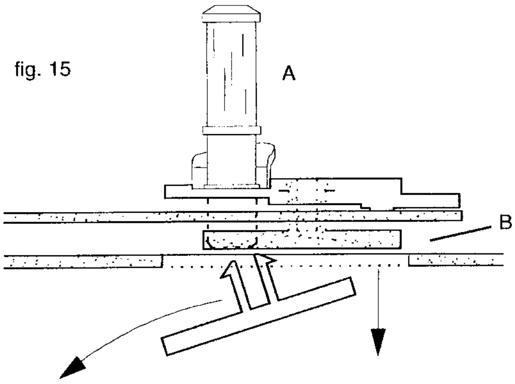
4.1.9 Roller unit left (Pos.23)

Set the drive assy to „Eject" position.
Unhook the tension arm spring (pos. 11), to avoid the tension arm spring being pre-loaded.
At the bottom side of the drive assy remove the tension lever (pos.112).
Compress the two snap hooks by means of a pair of tweezers (Fig. 9)and remove the roller assy (A) from the plate (B).
Unhinge the loading arm (left) from the holding plate and remove the latter downward from the drive assy through the recess in the chassis (Fig. 15).
The reassembly is carried out in reverse order.

NOTE : During reassembly
1. Place the carriage holding plate in the assembly with the half-round cutout nearest the rear of the deck.
2. When the loading arm is refitted ensure the pin on the underside of 23 is through the link of 24B.

After replacing the roller unit (left) the tape path has to be checked (paragraph 4.2.1.), and adjusted if necessary.

fig. 15

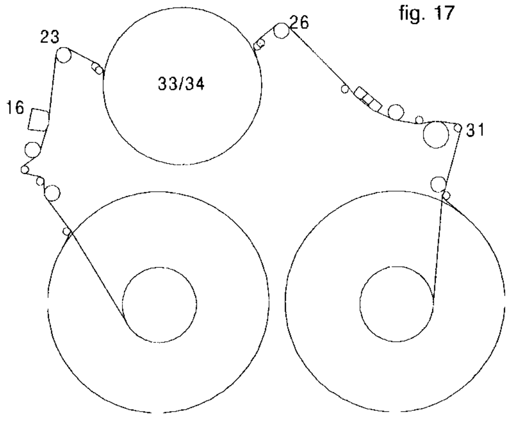


4.2 Adjustments

Adjustments must not be made in the service position.

4.2.1 Tape path

fig. 17


23
26
33/34
16
31

4.2.1.1 Roller left unit/roller unit right

Preparation:
Connect one input of a dual trace oscilloscope to observe the tape sync pulse CTL (pos.7460 IC SAA1310 pin16). The other input (DC coupled) to observe the tracking information TRIV.
Trigger the oscilloscope externally on the head pulse HP1 ("SWIN").
Playback the black and white section of the alignment test tape.
Set the deck in the condition where the video heads are running along the upper edge of the tracks only by:

1. Call the service test program (chapter 2.1)
2. Activate manual tracking (service test program step 03) and watch the tape sync pulse move to the left in relation to the TRIV signal.
3. Note the extreme left hand position reached by the sync pulse, repeat as necessary.
4. Stop the movement of the pulse when the TRIV signal reduces to 1/2 to 2/3 maximum amplitude by pressing the normal play button. A noisy picture (disturbances) is visible on the TV set and the CTL pulse should be to the left of the display.

The recorder will hold this position until the service test progam step 03 is left.
This condition works only if X-distance is adjusted.

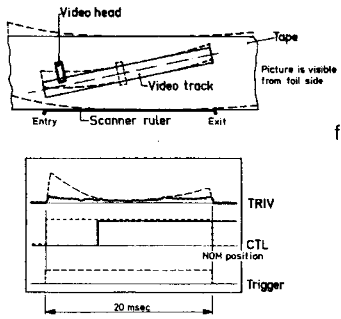

Video head
Tape
Picture is visible from foil side
Video track
Entry
Scanner ruler
Exit
TRIV
CTL
NOM position
Trigger
20 msec

fig. 18

Adjustment:
Adjust the left and right roller units to make the tracking signal TRIV straight and flat as possible (Fig. 18).

4.2.1.2 A/C Combi head

Tilt angle adjustment

Set the drive to feature mode (e.g. +7)
Adjustment :
By means of the tilt angle adjusting screw move the tape until the lower edge just touches the tape guide A1 (see Fig. 19) the tape must not be distorted at the lower edge (by pressing onto guide).

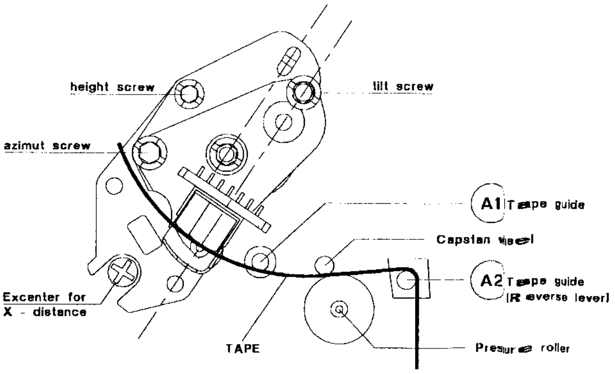

height screw
tilt screw
azimut screw
A1 Tape guide
Capstan wheel
A2 Tape guide (Reverse lever)
Excenter for X - distance
TAPE
Pressure roller

fig.19

Adjustment of the azimuth angle and the head height

Connect an oscilloscope to the linear Audio output.
Play the section of the test cassette with the audio signal 400 Hz.
Adjust for maximum output voltage by means of the height adjustment screw
Play the section of the test cassette with the audio signal 8 kHz.
Adjust to maximum output voltage by means of the azimuth adjustment screw (Fig. 19).
If necessary, repeat this procedure
Check the tilt angle adjustment

If the tape path was completely out of adjustment or if several components in the tape path have been replaced, it is possible, that the adjustments described in paragraph 4.2.1.1 and paragraph 4.2.1.2 have to be repeated several times.

4.2.2 Adjustment of the horizontal distance (x-distance)

Before this adjustment is carried out, insert the test cassette (start from Eject position). Call the service test program (tracking value will take up its nominal position) and press the „play" button. Playback the black/white part of the test cassette.)
Display the TRIV signal on an oscilloscope (DC-coupled) and adjust for maximum voltage by means of the excentric screw (Fig.19).

4.2.3 Brake band and tape tension

Due to further development it is no longer necessary to make theseadjustments after replacement of the brake band.
If the brake band or tape tension are completely misadjusted, set them to a center position; set the drive to „play" and adjust the brake band until the edge of the elbow of the tape tension arm is aligned with the left inner edge of the left guide (fig. 20).

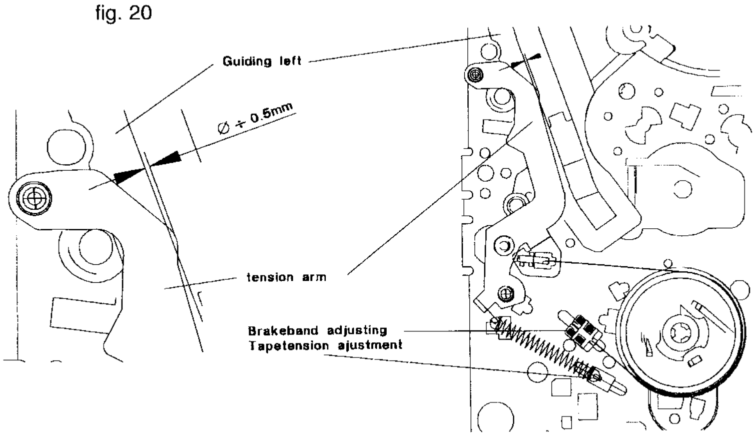
4.2.4 Friction clutch control check

Set the drive to „Play" position.
Place the torquemeter on the right reel.
Turn the capstan motor to move the right reel clockwise.
Keep turning, until the indication at the torquemeter no longer changes (Fig. 21)
The torque has to be 10,5 mNm +/-25% (105gFcm +/-25%)

4.2.5 Reverse brake control

Set the drive to „Reverse" position.
Place a torquemeter on the right reel and turn the latter counterclockwise, until the reel just starts to flip.
The value indicated at the torquemeter has to be 7mNm +/-3mNm (70 gFcm +/-30gFcm) (Fig. 21).

fig. 20



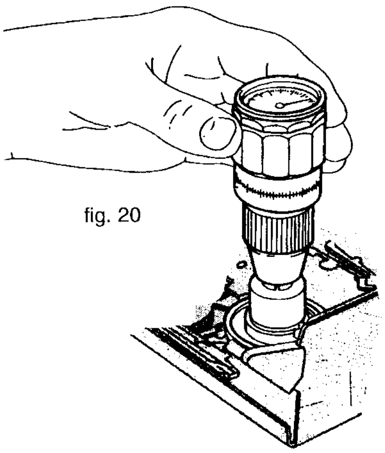
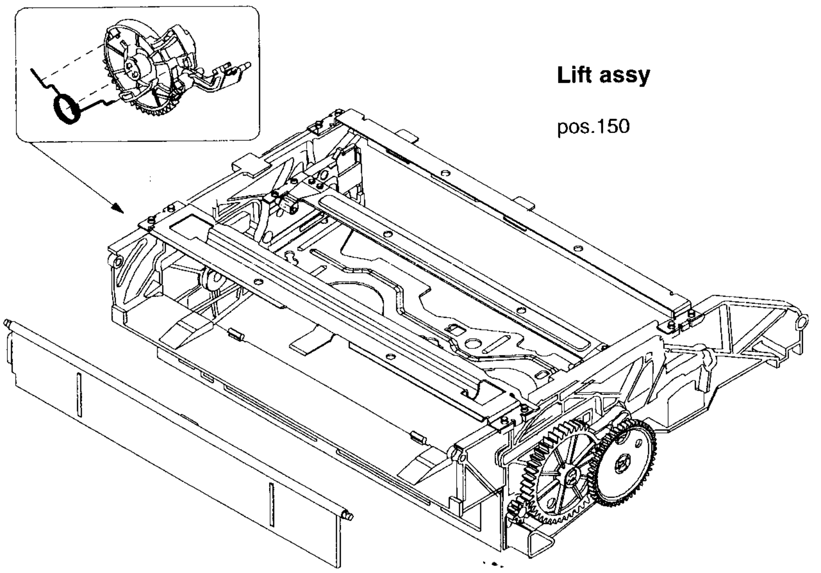


fig. 20

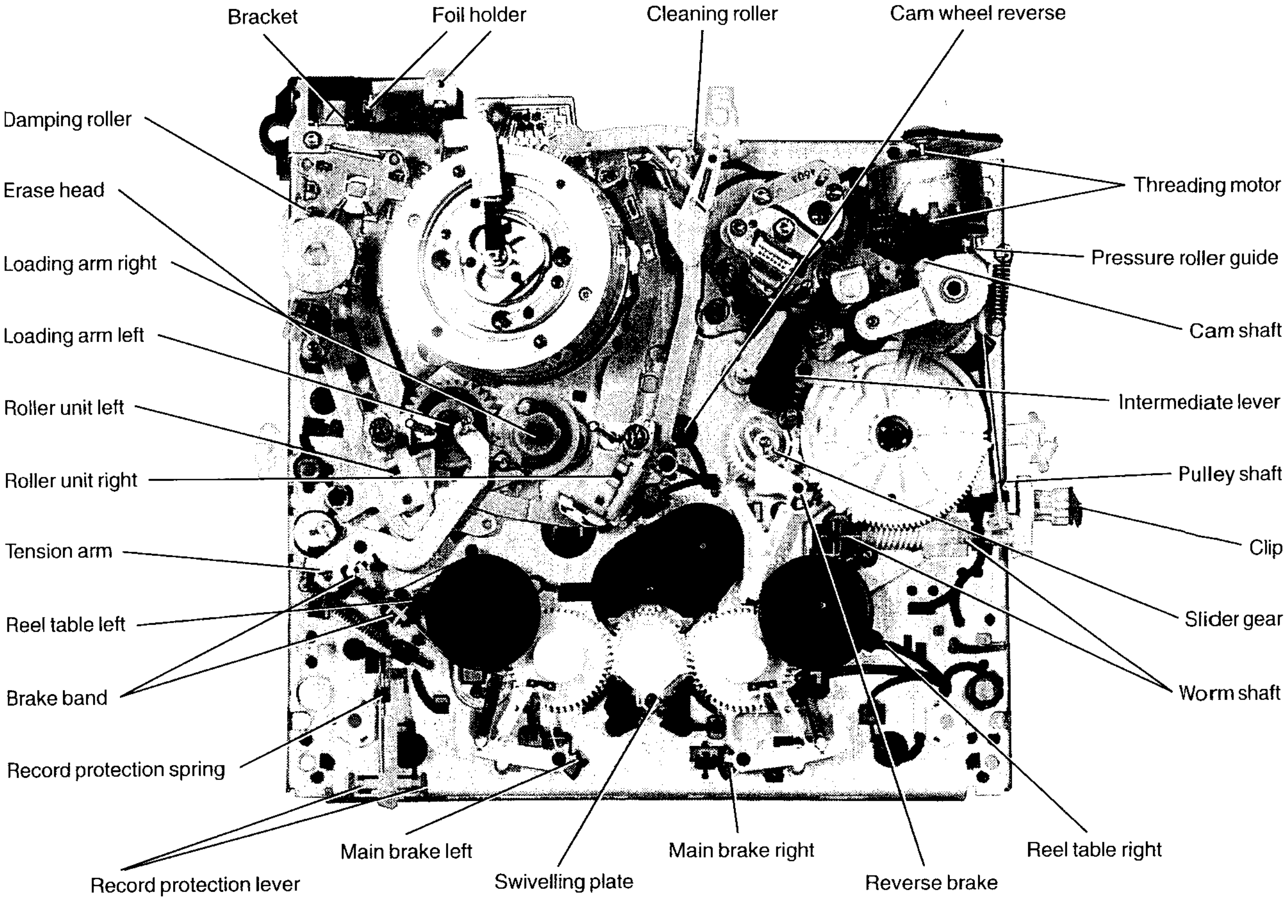


Lift assy

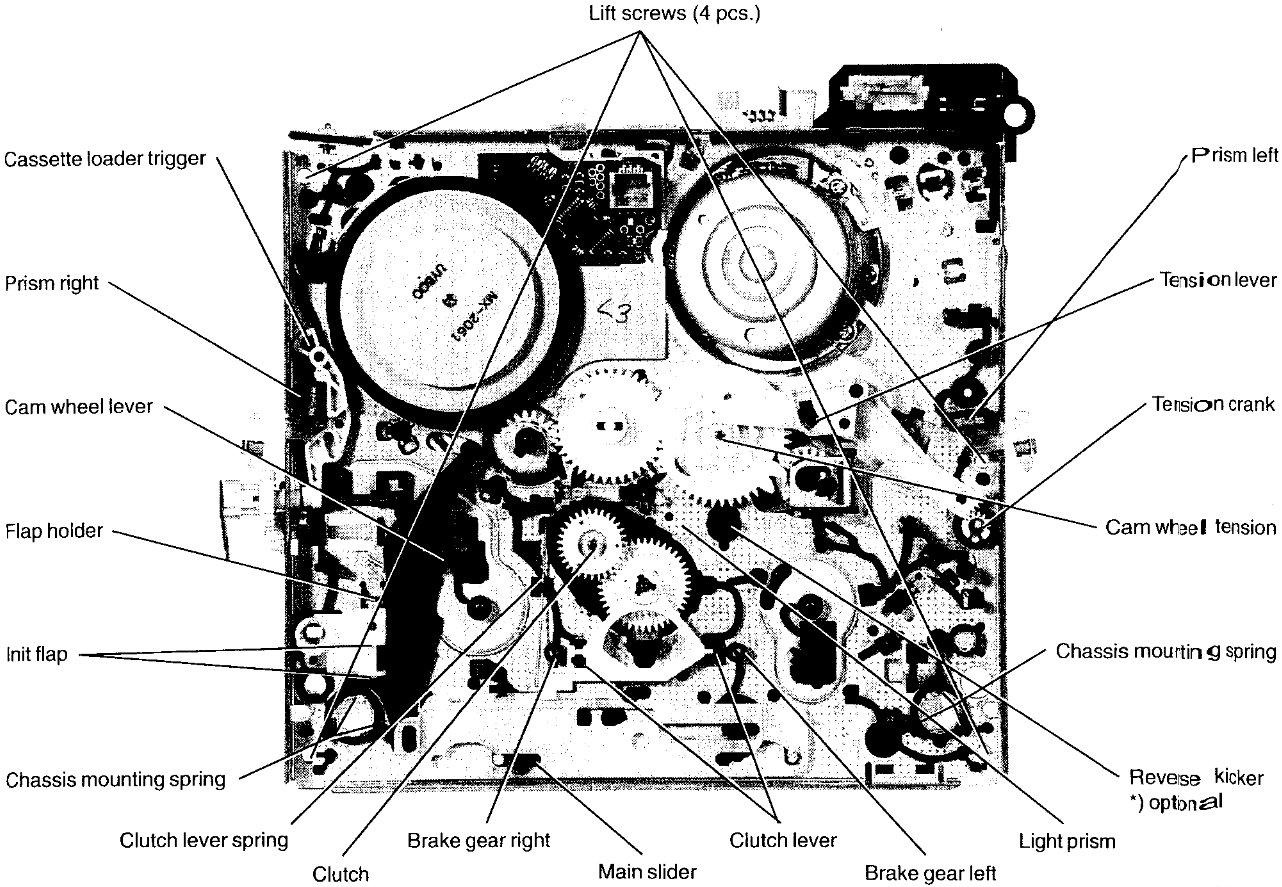
pos.150

In order to make the replacement of the deck parts easier, the snap hooks are marked with an arrow.

TOP VIEW

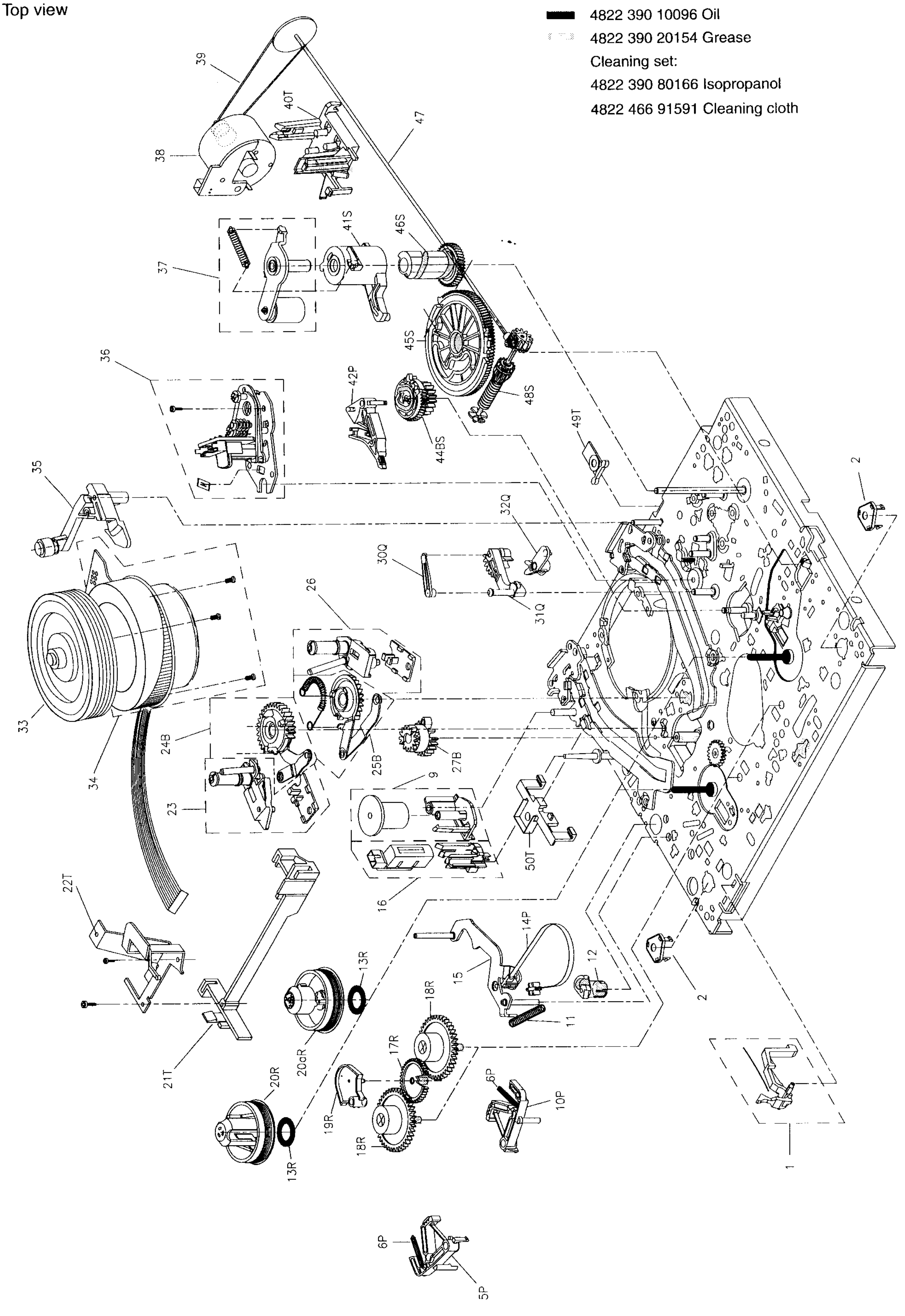

Bracket
Foil holder
Cleaning roller
Cam wheel reverse
Damping roller
Erase head
Loading arm right
Loading arm left
Roller unit left
Roller unit right
Tension arm
Reel table left
Brake band
Record protection spring
Record protection lever
Main brake left
Swivelling plate
Main brake right
Reverse brake
Reel table right
Threading motor
Pressure roller guide
Cam shaft
Intermediate lever
Pulley shaft
Clip
Slider gear
Worm shaft

UNDERSIDE VIEW


Lift screws (4 pcs.)
Cassette loader trigger
Prism right
Cam wheel lever
Flap holder
Init flap
Chassis mounting spring
Clutch lever spring
Clutch
Brake gear right
Main slider
Clutch lever
Brake gear left
Light prism
Prism left
Tension lever
Tension crank
Cam wheel tension
Chassis mounting spring
Reverse kicker
*) optional

4.2 Exploded view

Top view


39
38
40T
47
37
41S
46S
45S
36
42P
48S
44BS
49T
35
2
32Q
30Q
26
31Q
33
34
24B
23
25B
27B
9
16
50T
22T
14P
12
15
18R
13R
11
2
21T
20aR
17R
6P
20R
19R
10P
18R
13R
1
6P
5P

▬ 4822 390 10096 Oil

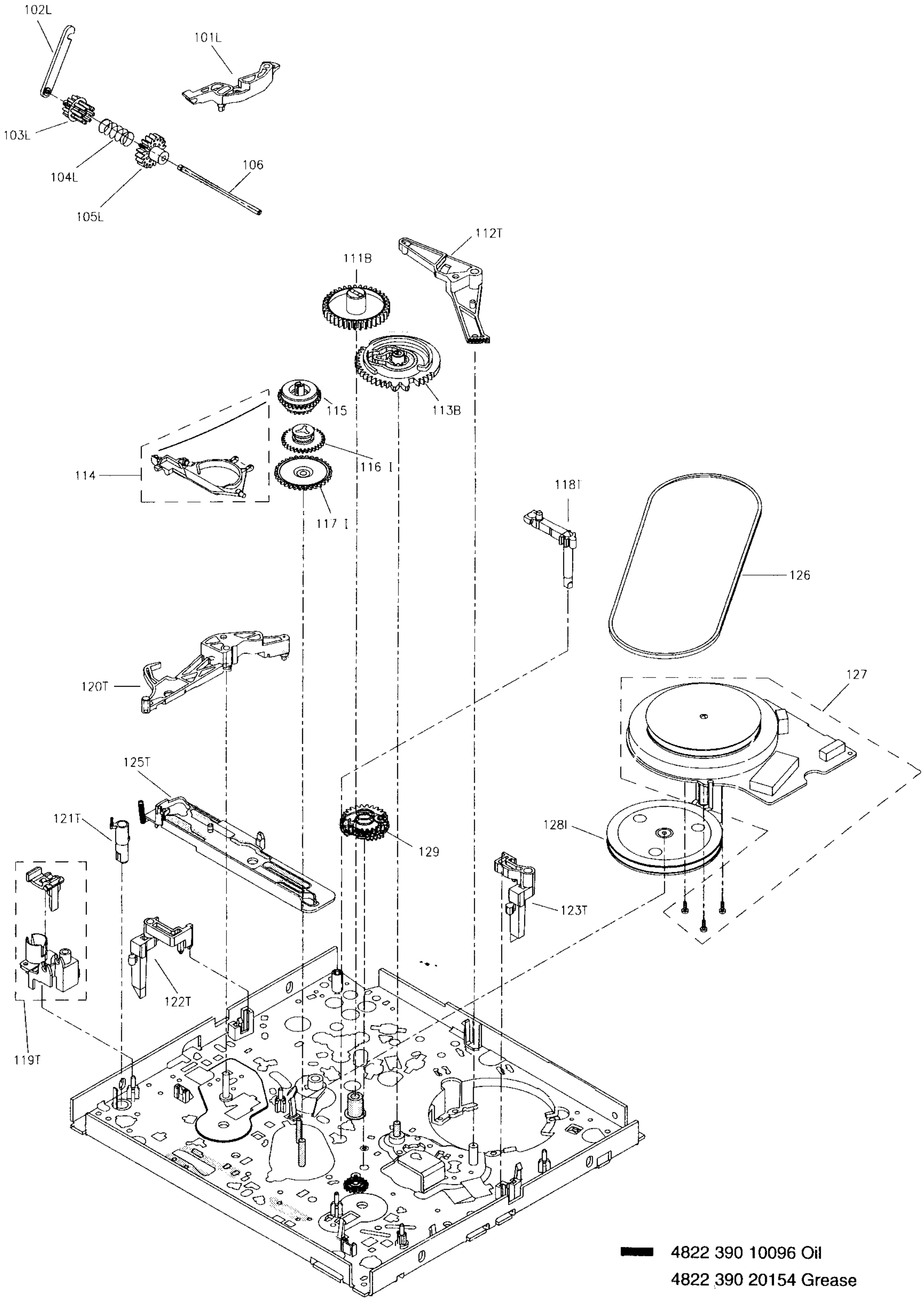
▨ 4822 390 20154 Grease

Cleaning set:

4822 390 80166 Isopropanol

4822 466 91591 Cleaning cloth

Underside view


102L
101L
103L
104L
106
105L
112T
111B
113B
115
116 I
114
117 I
118I
126
120T
127
125T
121T
129
128I
123T
122T
119T

▬ 4822 390 10096 Oil

4822 390 20154 Grease

Cleaning set:

4822 390 80166 Isopropanol

4822 466 91591 Cleaning cloth

4. DRIVE ASSEMBLY

4.1 MECHANICAL PARTS LIST

Pos.	Description	KITS								Code number 4822
		B	I	L	P	Q	R	S	T	
1	Rec. protection lever (with spring)									402 10202
2	Chassis mounting spring (2x)									492 71022
5	Main brake left				P					
6	Main brake spring (2x)				P					
9	Damping roller *)									528 70782
10	Main brake right				P					
11	Tension arm spring									492 33317
12	Tension crank									403 70551
13	Slip ring						R			
14	Tension band				P					
15	Tension arm									403 70547
16	Erase head									249 10522
17	Swivelling gear						R			
18	Brake gear (2x)						R			
19	Swivelling plate						R			
20	Reel table (S)						R			
20a	Reel table (T)						R			
21	Headamplifier holder								T	
22	Bracket								T	
23	Roller unit left									528 70771
24	Loading arm left	B								
25	Loading arm right	B								
26	Roller unit right									528 70772
27	Loading gear	B								
30	Reverse clip					Q				
31	Reverse lever					Q				
32	Intermediate lever					Q				
33	Head disc 4/2 (/1)									691 10548
33	Head disc 4/2 (/1)Secam									691 10551
34	Scanner motor 4/2 (with screws)									361 10901
35	Cleaning roller									528 70773
36	A/C Head (with clip and screws)									249 10468
37	Pressure roller (with spring)									528 70774
38	Threading motor									361 10809
39	Threading belt									358 20421
40	Motor holder								T	
41	Pressure roller guide							S		
42	Reverse brake				P					
44	Slider gear	B						S		
45	Cam wheel							S		
46	Cam shaft							S		
47	Pulley shaft									528 81462
48	Worm shaft							S		
49	Chassis mounting clip								T	
50	WD-holder								T	

Pos.	Description	KITS								Code number 4822
		B	I	L	P	Q	R	S	T	
101	Cassette loader trigger			L						
102	Clip			L						
103	Cassette loader gear1			L						
104	Cassette loader spring			L						
105	Cassette loader gear2			L						
106	Spindle									535 93277
111	Cam wheel reverse	B								
112	Tension lever								T	
113	Cam wheel tension	B								
114	Clutch lever (with spring)									403 70549
115	Clutch									528 20736
116	Changing gear		I							
117	Double gear		I							
118	Light prism								T	
119	Init flap and holder								T	
120	Cam wheel lever								T	
121	S-VHS lever								T	
122	Prism rihgt								T	
123	Prism left								T	
125	Main slider								T	
126	Driving belt									358 31166
127	Capstan motor (with screws)									361 10805
129	Reverse kicker with transmission gears *)									522 20451
128	Gear pulley		I							
150	Lift									443 64112
KIT	B									310 31955
KIT	I									310 31963
KIT	L									310 32116
KIT	P									310 32191
KIT	Q									310 10658
KIT	R									310 10659
KIT	S									310 10661
KIT	T									310 10662

*) optional

Um eine hohen Reparaturstandard zu gewährleisten sind mit Ausnahme von Kit T immer alle im Kit enthaltenen Teile zu tauschen.

In order to guarantee a high repairstandard all spare parts included in a kit have to be replaced with the exception of kit T.

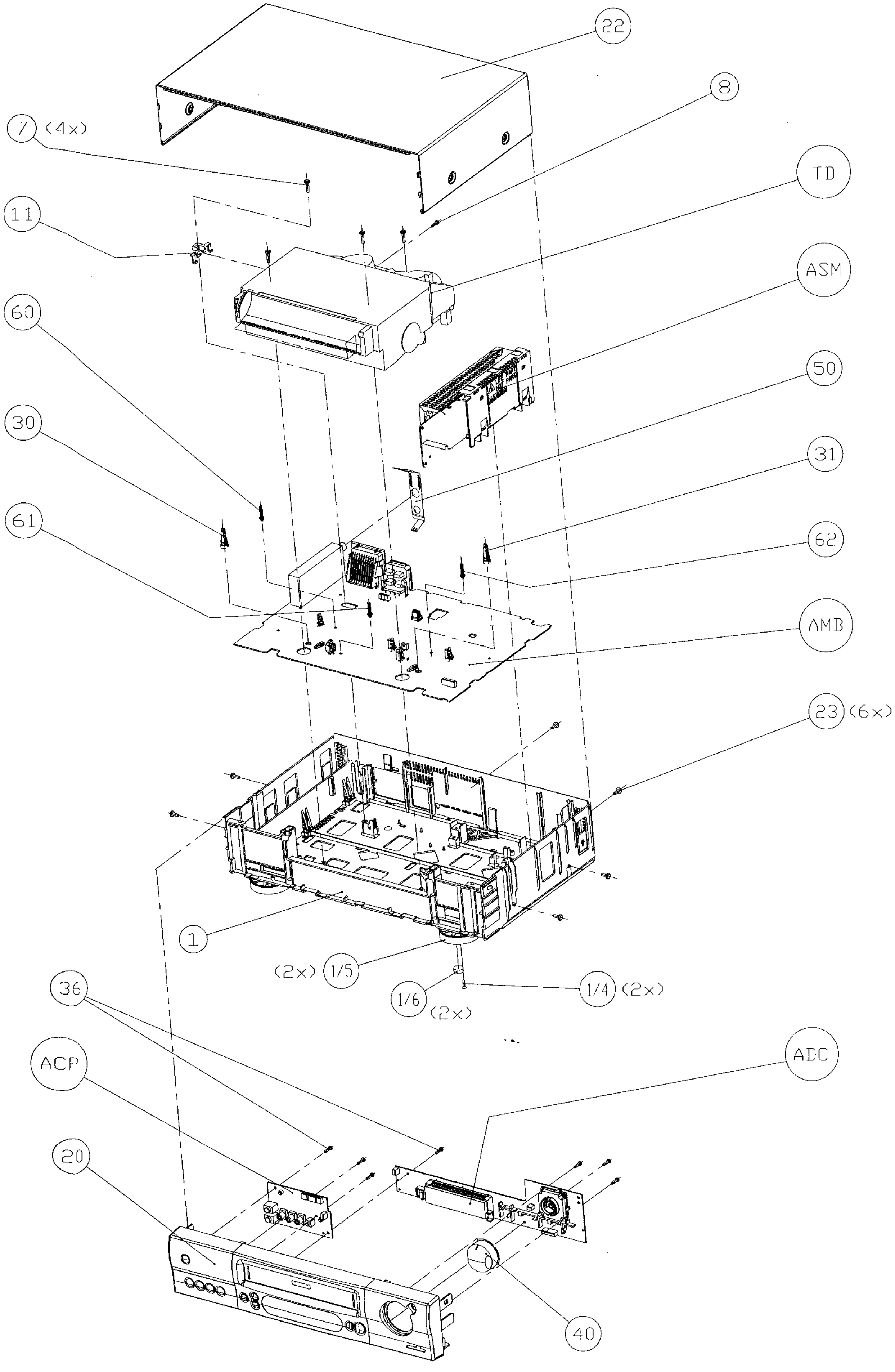
Per una riparazione garantita ocorre sostituire tutti i pezzi contenuti nei kit, fatta eccetione per il kit T.

Para obtener un estandár de reparaciones elevado,es necesario cambiar todas las partes contenidas en el kit, la única exceptiôn es para el kit T.

A fin d'obtenir un standard de réparations élevé, toutes les pièces de rechange incluses dans un kit sont à remplacer, exception faite du kit T.

Om een hoge reparatiekwaliteit te waarbogen moeten, met uitzondering van kit T, altijd alle zich in een kit bevindende onderdelen worden vervangen.

Exploded View of the Set & Mechanical Parts


22
8
7 (4x)
TD
11
ASM
60
50
30
31
61
62
AMB
23 (6x)
1
(2x) 1/5
1/6 (2x)
1/4 (2x)
36
ACP
ADC
20
40

Set Parts List

Position	Code Number	Description
1	4822 464 10465	FRAME ASSY
1/4	4822 502 11838	SCREW P2,9X12
1/5	4822 462 11114	FOOT ASSY
1/6	4822 462 41806	FOOT RUBBER INLAY
7	4822 502 13884	SCREW 3,5X16
8	4822 502 14431	SCREENING SCREW
11	4822 256 10504	TD-HOLDER
20	4822 426 10695	CONTROL PANEL ASSY VR800/02/16/58
20	4822 426 10696	CONTROL PANEL ASSY VR800/07
20	4822 426 10697	CONTROL PANEL ASSY VR800/39
20	4822 426 10739	CONTROL PANEL ASSY VR805/071
20	4822 426 10738	CONTROL PANEL ASSY VR805/161
20	4822 426 10737	CONTROL PANEL ASSY VR805/391
20	4822 426 10698	CONTROL PANEL ASSY VR850/02/16/58
20	4822 426 10699	CONTROL PANEL ASSY VR850/07
20	4822 426 10701	CONTROL PANEL ASSY VR850/39
20/6	4822 443 11044	LIFT FLAP ASSY VR800
20/6	4822 443 11085	LIFT FLAP ASSY VR805
20/6	4822 443 11048	LIFT FLAP ASSY VR850
20/7	4822 492 70896	LEG SPRING LIFT FLAP
20/11	4822 502 11839	SCREW 2,9X8
20/13	4822 443 11045	FLAP ASSY LEFT VR800/02
20/13	4822 443 11046	FLAP ASSY LEFT VR800/07
20/13	4822 443 11047	FLAP ASSY LEFT VR800/39
20/13	4822 443 11086	FLAP ASSY LEFT VR805/071
20/13	4822 443 11084	FLAP ASSY LEFT VR805/161
20/13	4822 443 11083	FLAP ASSY LEFT VR805/391
20/13	4822 443 11049	FLAP ASSY LEFT VR850/02
20/13	4822 443 11051	FLAP ASSY LEFT VR850/07
20/13	4822 443 11052	FLAP ASSY LEFT VR850/39
20/14	4822 417 11384	HINGE LEFT
20/15	4822 417 11385	HINGE RIGHT
22	4822 442 01513	COVER LAQUERED VR850
22	4822 442 01567	COVER LAQUERED VR805
22	4822 442 01511	COVER LAQUERED VR800
23	4822 502 14109	PLASTITE SCREW 3,5X1
30, 31	4822 256 10198	DISTANCE HOLDER DECK
36	4822 502 11838	SCREW P2,9X12
40	4822 410 11973	SHUTTLE KNOB ASSY
50	4822 492 11687	SPRING
60, 61, 62	4822 256 10359	DISTANCE HOLDER MOBO

Power Supply ASM

MISCELLANEOUS

1115		4822 267 51466	17P. Connector
1150	▲	4822 267 31064	Mains Connector
1151	▲	4822 070 31252	Fuse 1.25A
1152		4822 252 11215	Surge Protector
1153	▲	4822 071 51001	Fuse 100mA

CAPACITORS

2150	▲	4822 121 10512	220	nF	275V
2151		4822 121 10789	100	nF	400V
2152		4822 124 11561	47	µF	400V
2153	▲	4822 126 14088	2,2	nF	250V
2154		4822 124 80604	47	µF	50V
2155		4822 121 43526	47	nF	250V
2156		4822 126 14126	47	pF	2KV
2157		4822 126 14126	47	pF	2KV
2158		4822 126 13614	4	nF	50V
2159		5322 122 32331	1	nF	100V
2160		5322 121 42386	100	nF	63V
2161		4822 121 70647	680	pF	100V
2162		5322 121 42386	100	nF	63V
2163		4822 124 40433	47	µF	25V
2164		4822 124 81029	100	µF	25V
2165		4822 124 12284	470	µF	
2166		4822 124 12284	470	µF	
2167		4822 124 12284	470	µF	
2168		4822 121 70162	10	nF	400V
2170		4822 124 80604	47	µF	50V
2172		4822 126 13614	4	nF	50V
2173		4822 124 12285	2200	µF	
2174		4822 124 12181	1000	µF	6,3V
2175		5322 121 42386	100	nF	63V

RESISTORS

3150		4822 116 21227	VDR		
3151	▲	4822 053 21335	3,3	M	0,5W
3152		4822 116 83872	220	R	0,5W
3153	▲	4822 053 21335	3,3	M	0,5W
3154	▲	4822 053 21335	3,3	M	0,5W
3155	▲	4822 052 10109	10	R	0,33W
3156		4822 053 11123	12	k	2W
3157	▲	4822 052 10102	1	k	0,33W
3158	▲	4822 052 10479	47	R	0,33W
3159		4822 116 52199	68	R	0,5W
3160		4822 116 83883	470	R	0,5W
3161		4822 116 52249	1,8	k	0,5W
3162		4822 116 52304	82	k	0,5W
3163		4822 116 52303	8,2	k	0,5W
3164		4822 116 52256	2,2	k	0,5W
3165		4822 116 52283	4,7	k	0,5W
3166		4822 116 52257	22	k	0,5W
3167		4822 050 23902	3,9	k	0,6W
3168		4822 116 52244	15	k	0,5W
3169		4822 050 21003	10	k	0,6W
3170		4822 116 83883	470	R	0,5W
3171		4822 050 21008	1	R	0,6W
3172		4822 116 52176	10	R	0,5W
3175		4822 116 83872	220	R	0,5W
3176		4822 050 11002	1	k	0,4W
3177		4822 116 83864	10	k	0,5W
3178		4822 050 25602	5,6	k	0,6W
3179		4822 101 11383	470, 3		R
3180		4822 050 24702	4,7	k	0,6W
3181		4822 116 52176	10	R	0,5W
3182		4822 116 52176	10	R	0,5W
3183		4822 116 83868	150	R	0,5W
3184		4822 116 83864	10	k	0,5W
3185		4822 116 52228	680	R	0,5W
3186		4822 050 11002	1	k	0,4W
3187		4822 116 83883	470	R	0,5W
3188		4822 116 83874	220	k	0,5W
3189		4822 116 83884	47	k	0,5W
3190		4822 050 11002	1	k	0,4W
3191	▲	4822 052 10479	47	R	0,33W
3192		4822 116 52276	3,9	k	0,5W
3193		4822 116 52297	68	k	0,5W
3194		4822 116 52283	4,7	k	0,5W
3195	▲	4822 052 10478	4,7	R	0,33W
3196		4822 116 52228	680	R	0,5W
3197		4822 116 52235	1	M	0,5W
3198		4822 116 83874	220	k	0,5W
3199		4822 050 23309	33	R	0,6W

COILS

5150	▲	4822 157 10454	LINE FILTER CHOKE (TDK)
5151	▲	4822 146 11056	TRANSF. SRW32ES
5153		4822 157 11736	IND FXD BEAD 150MHZ 1K B
5154		4822 157 51462	10µH
5155		4822 157 53005	0,33µH 20%
5156		4822 157 11737	22µH 10% 9X9,5

DIODES

6151	4822 130 31603	1N4006
6152	4822 130 31603	1N4006
6153	4822 130 31603	1N4006
6154	4822 130 31603	1N4006
6155	4822 130 31878	1N4003G
6156	4822 130 31878	1N4003G
6157	4822 130 42606	BYD33J
6158	4822 130 31878	1N4003G
6159	4822 130 31878	1N4003G
6160	4822 130 31603	1N4006
6161	4822 130 31983	BAT85
6162	4822 130 33948	MTZJ5.6B
6163	4822 130 33948	MTZJ5.6B
6164	4822 130 83909	BYW98-200RL
6165	4822 130 83909	BYW98-200RL
6166	5322 130 31938	BYV27-200
6167	4822 130 42488	BYD33D
6168	4822 130 34142	BZX79-B33
6169	4822 130 42488	BYD33D
6170	4822 130 32715	SB340
6172	4822 130 30621	1N4148
6173	4822 130 30621	1N4148
6174	4822 130 30621	1N4148

TRANSISTORS & IC's

7150		4822 130 63722	STP3NA60FI-1153
7151		4822 209 90025	MC44603P
7152	▲	4822 209 32126	SOC1012T
7153		4822 209 81397	TL431CLPST
7154		4822 130 41246	BC327-25
7155		4822 130 41246	BC327-25
7156		4822 130 40959	BC547B
7157		4822 130 40959	BC547B
7158		4822 130 10214	STD17N06
7159		4822 130 40959	BC547B
7160		4822 130 41782	BF422
7161		4822 130 41246	BC327-25

REPAIR KITS

4822 310 11237	POWER SUPPLY REPAIR KIT

▲... Safety component, use only this type

Motherboard

MISCELLANEOUS

7	4822 256 10195	REEL TABLE TACHH. DECK
8	4822 256 10196	TACHO-HOLDER
20	4822 256 10197	MOBO SENSOR-HOLDER DECK
21	4822 256 10197	MOBO SENSOR-HOLDER DECK
22	4822 256 10197	MOBO SENSOR-HOLDER DECK
1001	4822 242 10695	4 433 619 MHZ
1322 ▲	4822 071 55001	Fuse 500mA
1323 ▲	4822 071 51002	Fuse 1A
1324 ▲	4822 071 55001	Fuse 500mA
1325 ▲	4822 071 51002	Fuse 1A
1451	4822 242 10956	20MHZ 20P AT-49
1460	4822 277 11521	SWITCH 1 ASSY DECK
1461	4822 277 11521	SWITCH 1 ASSY DECK
1701	4822 242 81854	SAW Filter G9353M for PAL BG
1701	4822 242 10306	OFW K9463M PAL I, P/SEC DK
1701	4822 242 10688	OFW K9456M for SECAM L
1702	4822 242 10307	OFW G3956M for PAL BG/DK
1702	4822 242 81436	OFW K3953M for PAL I, SEC L
1703	4822 242 10428	EFCT5R5YS5A, not for PAL I
1703	4822 242 70279	SFE6,0MB for PAL I
1704	4822 242 10429	EFCT6R5YS5A for PAL/SEC DK
1704	4822 242 70279	SFE6,0MB, for SECAM L
1705	4822 242 72586	TPS5,5MB-TF20, not for PAL I
1705	4822 242 81572	TPS6,0MB-TF21, for PAL I
1706	4822 242 10563	EFCT5R74YS5A
1707	4822 242 10754	EFCT6R25YS5A
1709	4822 210 10833	BOOSTER PLT for SECAM L
1709	4822 210 10832	Tumod VHF/UHF, PAL-B/G
1709	4822 210 10834	Tumod VHF/UHF PAL I
1709	4822 210 10835	Tumod VHF/UHF Modul. D/K

when changing Tumod order also spring 4822 492 11687

1911	4822 267 10364	CONN. 9P
1942	4822 267 10871	17POL. FEM.
1944	4822 267 51255	14 P
1946	4822 267 10366	CAPSTAN-MOBO-SOCKEL
1947	4822 267 10957	CONN. 3P
1948	4822 267 41062	6 pin
1951	4822 265 11422	SCART CONN BLACK 7133
1952	4822 264 10346	SCART CONN. BLUE 7135D
1954	4822 265 41077	CINCH connector
1956	4822 267 10953	CONN. 7P
1957	4822 267 10584	CONN. 1P
1960	4822 267 10953	CONN. 7P
1961	4822 267 10954	CONN. 5P
1964	5322 268 90415	B2B-PH-K
1971	4822 242 82059	ZAK2863 (10MHZ)
1991	4822 267 10957	CONN. 3P

CAPACITORS

2000	4822 126 10002	100	nF	25V
2001	4822 122 33177	10	nF	50V
2002	4822 122 33177	10	nF	50V
2003	4822 122 33177	10	nF	50V
2004	4822 126 13836	10	A	50V
2005	4822 126 13836	10	A	50V
2006	4822 122 33177	10	nF	50V
2007	4822 122 33177	10	nF	50V
2008	4822 126 10002	100	nF	25V
2009	4822 122 33177	10	nF	50V
2010	5322 122 31873	2,7	pF	100V
2011	4822 126 10002	100	nF	25V
2012	4822 126 13751	47	nF	63V
2013	5322 122 32654	22	nF	63V
2014	4822 126 10002	100	nF	25V
2015	4822 124 22651	1,0	µF	50V
2016	4822 126 13296	100	nF	16V
2017	4822 126 13836	100	A	16V
2018	4822 124 21732	10	µF	25V
2019	4822 124 21732	10	µF	25V
2020	4822 122 33177	10	nF	50V
2021	4822 124 21732	10	µF	25V
2022	4822 126 10002	100	nF	25V
2023	4822 126 10002	100	nF	25V
2024	4822 124 11946	22	µF	16V
2025	4822 122 33177	10	nF	50V
2026	4822 122 33177	10	nF	50V
2027	4822 124 40246	4,7	µF	
2028	4822 122 33177	10	nF	50V
2029	4822 126 13836	1	µF	16V
2030	4822 124 22651	1,0	µF	50V
2032	4822 122 33177	10	nF	50V
2033	4822 122 33177	10	nF	50V
2034	4822 126 10002	100	nF	25V
2035	4822 124 11946	22	µF	16V
2036	4822 126 14124	220	pF	
2037	5322 122 32658	22	pF	50V
2038	4822 126 13222	390	pF	63V
2039	4822 124 12052	220	µF	6,3V
2040	4822 126 13695	82	pF	63V
2041	4822 126 10002	100	nF	25V
2042	5322 122 32658	22	pF	50V
2043	5322 122 32966	39	pF	50V
2044	4822 126 10002	100	nF	25V
2045	4822 122 33177	10	nF	50V
2047	4822 124 22726	4,7	µF	35V
2049	4822 126 13691	27	pF	63V
2050	4822 122 33177	10	nF	50V
2052	4822 122 33575	220	pF	50V
2053	4822 124 80231	47	µF	16V
2054	4822 124 40246	4,7	µF	
2055	4822 124 80231	47	µF	16V
2056	4822 124 40246	4,7	µF	
2057	4822 122 33797	47	nF	50V
2060	4822 126 10002	100	nF	25V
2061	4822 126 10002	100	nF	25V
2062	4822 126 13486	15	pF	63V
2063	4822 122 33177	10	nF	50V
2064	4822 122 33575	220	pF	50V
2065	4822 122 33177	10	nF	50V
2066	4822 126 13694	68	pF	63V
2067	5322 122 33538	150	pF	63V
2068	4822 122 33177	10	nF	50V
2069	5322 122 32658	22	pF	50V
2070	5322 122 32531	100	pF	50V
2071	5322 122 34123	1	nF	50V
2072	5322 122 34123	1	nF	50V
2073	5322 122 32659	33	pF	50V
2074	4822 122 33177	10	nF	50V
2075	4822 122 33177	10	nF	50V
2076	4822 122 33177	10	nF	50V
2077	4822 126 10002	100	nF	25V
2078	4822 122 33177	10	nF	50V
2079	5322 122 34123	1	nF	50V
2080	4822 122 33177	10	nF	50V
2081	4822 126 10002	100	nF	25V
2082	5322 122 32269	6,8	pF	50V
2083	4822 126 13692	47	pF	63V
2084	4822 122 33575	220	pF	50V
2085	5322 122 34123	1	nF	50V
2086	4822 126 10002	100	nF	25V
2087	4822 126 13695	82	pF	63V
2088	4822 122 33575	220	pF	50V
2089	4822 126 13691	27	pF	63V
2090	4822 126 13691	27	pF	63V
2091	4822 126 13695	82	pF	63V
2092	4822 126 13695	82	pF	63V
2093	4822 126 13692	47	pF	63V
2094	4822 126 10002	100	nF	25V
2095	4822 126 13836	1	µF	16V
2099	4822 126 10002	100	nF	25V
2101	5322 122 32531	100	pF	50V
2104	5322 122 32658	22	pF	50V
2105	4822 126 13061	220	nF	25V
2106	4822 124 80231	47	µF	16V
2107	4822 122 33177	10	nF	50V
2108	5322 122 32654	22	nF	63V
2110	4822 122 33177	10	nF	50V
2111	4822 122 33177	10	nF	50V
2112	4822 122 33177	10	nF	50V
2113	4822 122 33177	10	nF	50V
2114	4822 122 33177	10	nF	50V
2115	4822 122 33177	10	nF	50V
2116	4822 122 33177	10	nF	50V
2117	4822 122 33177	10	nF	50V
2118	4822 122 33177	10	nF	50V
2122	4822 126 13061	220	nF	25V
2123	4822 122 33177	10	nF	50V
2124	4822 122 33177	10	nF	50V

▲ ... Safety component, use only this type

Motherboard

2125	4822 124 80231	47 µF 16V
2126	5322 122 32659	33 pF 50V
2321	4822 126 10002	100 nF 25V
2322	4822 126 10002	100 nF 25V
2323	4822 124 22263	220 µF 25V
2324	4822 124 22263	220 µF 25V
2325	5322 121 42661	330 nF 63V
2326	4822 124 22263	220 µF 25V
2328	4822 124 22726	4,7 µF 35V
2400	4822 124 22726	4,7 µF 35V
2401	4822 126 10002	100 nF 25V
2402	5322 122 32531	100 pF 50V
2403	5322 122 32531	100 pF 50V
2404	4822 122 33175	2,2 nF 50V
2405	4822 122 33575	220 pF 50V
2406	4822 124 22726	4,7 µF 35V
2407	4822 122 33575	220 pF 50V
2408	4822 126 13836	1 µF 50V
2409	4822 122 33575	220 pF 50V
2411	4822 122 33175	2,2 nF 50V
2412	4822 122 33177	10 nF 50V
2451	4822 126 10002	100 nF 25V
2452	4822 124 11946	22 µF 16V
2453	4822 126 13836	1 µF 16V
2454	4822 126 10002	100 nF 25V
2455	4822 126 10002	100 nF 25V
2456	4822 126 13691	27 pF 63V
2457	5322 122 32659	33 pF 50V
2458	4822 122 33177	10 nF 50V
2459	4822 126 13691	27 pF 63V
2461	5322 126 10223	4,7 nF 63V
2462	4822 124 81029	100 µF 25V
2463	4822 122 33177	10 nF 50V
2471	4822 124 80231	47 µF 16V
2472	4822 124 22726	4,7 µF 35V
2473	5322 126 10223	4,7 nF 63V
2474	4822 122 33175	2,2 nF 50V
2475	4822 124 80231	47 µF 16V
2476	4822 126 12105	33 nF 63V
2477	4822 126 10002	100 nF 25V
2478	4822 122 33177	10 nF 50V
2479	4822 122 33177	10 nF 50V
2480	4822 124 22726	4,7 µF 35V
2482	4822 126 10002	100 nF 25V
2483	5322 122 32654	22 nF 63V
2484	4822 124 80854	1 µF 50V
2485	4822 124 80854	1 µF 50V
2486	4822 124 80854	1 µF 50V
2487	4822 126 10002	100 nF 25V
2489	4822 124 22263	220 µF 25V
2490	4822 126 10002	100 nF 25V
2491	5322 122 32531	100 pF 50V
2492	5322 122 32654	22 nF 63V
2493	4822 122 33177	10 nF 50V
2494	4822 126 10002	100 nF 25V
2495	4822 122 33797	47 nF 50V
2496	5322 122 32654	22 nF 63V
2497	4822 122 33177	10 nF 50V
2501	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2502	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2503	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2504	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2505	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2506	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2507	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2508	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2509	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2510	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2511	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2512	4822 116 10056	VDR 0805 1MA/8V MAX 21V
2513	4822 124 22726	4,7 µF 35V
2514	4822 124 80231	47 µF 16V
2515	4822 126 10002	100 nF 25V
2516	4822 126 10002	100 nF 25V
2517	4822 126 10002	100 nF 25V
2518	4822 126 10002	100 nF 25V
2519	4822 126 10002	100 nF 25V
2520	4822 126 10002	100 nF 25V
2521	4822 126 10002	100 nF 25V
2522	4822 126 10002	100 nF 25V
2523	4822 124 80231	47 µF 16V

2601	4822 126 10002	100 nF 25V
2602	4822 124 11946	22 µF 16V
2603	4822 124 80231	47 µF 16V
2604	4822 126 13836	1 µF 16V
2605	4822 122 33177	10 nF 50V
2606	4822 126 10002	100 nF 25V
2607	4822 124 80231	47 µF 16V
2608	4822 126 10002	100 nF 25V
2609	4822 124 80231	47 µF 16V
2610	4822 126 13188	15 nF 63V
2611	4822 126 14127	39 nF 50V
2612	4822 122 33175	2,2 nF 50V
2613	4822 124 21732	10 µF 25V
2614	4822 126 10002	100 nF 25V
2615	4822 124 80231	47 µF 16V
2616	4822 124 22652	2,2 µF 50V
2617	4822 126 13836	1 µF 16V
2618	4822 122 33177	10 nF 50V
2619	5322 122 34123	1 nF 50V
2620	5322 122 31863	330 pF 50V
2621	5322 122 34123	1 nF 50V
2622	4822 122 33806	820 pF 63V
2623	4822 124 21732	10 µF 25V
2624	4822 126 13751	47 nF 63V
2625	4822 121 51574	12 nF 50V
2626	4822 124 11946	22 µF 16V
2641	4822 124 80231	47 µF 16V
2642	5322 122 34123	1 nF 50V
2643	4822 124 80231	47 µF 16V
2644	4822 121 43873	27 nF 50V
2645	4822 126 12105	33 nF 63V
2646	4822 121 41857	10 nF 250V
2651	4822 124 22726	4,7 µF 35V
2652	4822 122 33177	10 nF 50V
2653	4822 126 13296	100 nF 16V
2654	5322 122 32654	22 nF 63V
2655	4822 124 22652	2,2 µF 50V
2656	5322 122 32531	100 pF 50V
2657	4822 126 13296	100 nF 16V
2658	4822 122 33891	3,3 nF 63V
2659	4822 124 80231	47 µF 16V
2660	4822 124 21732	10 µF 25V
2661	4822 126 13296	100 nF 16V
2662	4822 122 33177	10 nF 50V
2663	4822 122 33891	3,3 nF 63V
2664	4822 124 80231	47 µF 16V
2665	4822 124 21732	10 µF 25V
2666	5322 122 34123	1 nF 50V
2668	4822 126 13061	220 nF 25V
2669	4822 126 13061	220 nF 25V
2671	4822 124 22651	1,0 µF 50V
2672	4822 124 22651	1,0 µF 50V
2673	4822 124 21732	10 µF 25V
2674	4822 126 13061	220 nF 25V
2675	4822 126 13061	220 nF 25V
2676	4822 124 21732	10 µF 25V
2677	4822 126 13061	220 nF 25V
2678	4822 126 13061	220 nF 25V
2679	4822 124 22651	1,0 µF 50V
2680	4822 124 21732	10 µF 25V
2681	4822 124 22651	1,0 µF 50V
2682	4822 126 13061	220 nF 25V
2683	4822 124 21732	10 µF 25V
2684	4822 126 13836	1 µF 16V
2685	4822 124 21732	10 µF 25V
2686	4822 126 13061	220 nF 25V
2687	4822 126 10002	100 nF 25V
2701	4822 124 81151	22 µF 50V
2702	4822 126 10002	100 nF 25V
2703	4822 126 10002	100 nF 25V
2704	4822 126 13836	1 µF 16V
2705	4822 126 13061	220 nF 25V
2706	4822 126 14319	8,2 pF 50V
2707	5322 122 34123	1 nF 50V
2708	4822 126 13836	1 µF 16V
2709	4822 122 33177	10 nF 50V
2710	4822 122 33575	220 pF 50V
2713	4822 124 11946	22 µF 16V
2715	5322 122 33861	120 pF 50V
2716	4822 126 10002	100 nF 25V
2717	4822 124 22726	4,7 µF 35V

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2718	4822 126 10002	100	nF	25V
2719	5322 122 32268	470	pF	50V
2720	4822 126 14498	10	µF	
2721	4822 126 13838	100	nF	
2722	4822 124 11946	22	µF	16V
2723	4822 124 22652	2,2	µF	50V
2725	4822 124 22652	2,2	µF	50V
2726	4822 126 10002	100	nF	25V
2730	4822 126 13836	1	µF	16V
2734	5322 124 41379	2,2	µF	50V
2771	4822 124 21732	10	µF	25V
2772	4822 122 33177	10	nF	50V
2773	4822 126 10002	100	nF	25V
2774	4822 126 10002	100	nF	25V
2775	4822 122 33177	10	nF	50V
2776	4822 124 41584	100	µF	10V
2777	5322 126 10184	680	pF	
2778	5322 122 32531	100	pF	50V
2779	4822 122 33177	10	nF	50V
2780	4822 126 13836	1	µF	16V
2781	4822 126 13836	1	µF	16V
2782	4822 124 40246	4,7	µF	
2783	4822 124 40246	4,7	µF	
2784	4822 126 13836	1	µF	16V
2801	5322 122 32448	10	pF	50V
2802	4822 126 10002	100	nF	25V
2803	4822 126 10002	100	nF	25V
2804	4822 124 80231	47	µF	16V
2805	4822 126 13836	1	µF	16V
2806	5322 122 32448	10	pF	50V
2807	5322 126 10184	680	pF	
2808	4822 126 13836	1	µF	16V
2809	4822 126 13836	1	µF	16V
2810	4822 126 13836	1	µF	16V
2811	4822 122 33177	10	nF	50V
2812	4822 124 80231	47	µF	16V
2813	4822 126 10002	100	nF	25V
2814	4822 122 33177	10	nF	50V
2815	4822 122 33177	10	nF	50V
2816	4822 122 33177	10	nF	50V
2817	4822 126 10002	100	nF	25V
2818	4822 122 33177	10	nF	50V
2819	4822 122 33177	10	nF	50V
2820	5322 126 10223	4,7	nF	63V
2821	4822 122 33177	10	nF	50V
2822	4822 124 40246	4,7	µF	
2823	4822 124 80231	47	µF	16V
2824	4822 126 13836	1	µF	16V
2825	4822 122 33177	10	nF	50V
2826	4822 122 33177	10	nF	50V
2827	4822 124 21732	10	µF	25V
2828	5322 126 10511	1	nF	50V
2829	5322 126 10511	1	nF	50V
2830	4822 126 10002	100	nF	25V
2831	4822 124 21732	10	µF	25V
2832	4822 122 33175	2,2	nF	50V
2833	4822 122 33175	2,2	nF	50V
2834	4822 126 10326	180	pF	63V
2835	4822 126 10326	180	pF	63V
2836	4822 126 13836	1	µF	16V
2837	4822 126 13836	1	µF	16V
2839	4822 124 12052	220	µF	6,3V
2841	4822 124 12052	220	µF	6,3V
2845	4822 122 33175	2,2	nF	50V
2846	4822 126 13836	1	µF	16V
2847	5322 122 32531	100	pF	50V
2849	4822 126 10002	100	nF	25V
2850	5322 121 42386	100	nF	63V
2851	4822 124 80231	47	µF	16V
2852	4822 126 10002	100	nF	25V
2853	4822 126 10002	100	nF	25V
2854	4822 126 13482	470	nF	16V
2855	4822 126 13296	100	nF	16V
2856	4822 126 13751	47	nF	63V
2857	5322 122 33861	120	pF	50V
2860	5322 122 34123	1	nF	50V
2863	4822 126 13061	220	nF	25V
2864	5322 122 33244	8,2	pF	50V
2865	5322 122 32658	22	pF	50V
2866	4822 126 10002	100	nF	25V
2867	5322 122 32658	22	pF	50V
2868	5322 126 10184	680	pF	
2869	4822 126 13836	1	µF	16V

RESISTORS

3001	4822 116 52256	2,2	k	0,5W
3002	4822 051 20182	1,8	k	0,1W
3003	4822 051 10102	1	k	0,25W
3004	4822 051 20822	8,2	k	0,1W
3005	4822 051 10102	1	k	0,25W
3006	4822 116 52289	5,6	k	0,5W
3008	4822 116 83884	47	k	0,5W
3009	4822 051 20101	100	R	0,1W
3010	4822 116 83884	47	k	0,5W
3011	4822 050 11002	1	k	0,4W
3012	4822 116 83882	39	k	0,5W
3013	4822 051 20105	1	M	0,1W
3017	4822 117 11449	2,2	k	0,1W
3019	4822 117 10361	680	R	0,1W
3020	4822 117 11721	1,3	k	0.1W
3021	4822 051 20224	220	k	0,1W
3022	4822 051 20154	150	k	0,1W
3023	4822 051 20101	100	R	0,1W
3024	4822 117 10833	10	k	0,1W
3025	4822 117 11504	270	R	0.1W
3026	4822 051 20472	4,7	k	0,1W
3027	4822 051 20471	470	R	0,1W
3029	4822 051 20471	470	R	0,1W
3030	4822 116 52228	680	R	0,5W
3031	4822 051 10102	1	k	0,25W
3032	4822 117 11449	2,2	k	0,1W
3034	4822 116 52256	2,2	k	0,5W
3035	4822 116 52175	100	R	0,5W
3037	4822 117 11449	2,2	k	0,1W
3038	4822 116 52256	2,2	k	0,5W
3040	4822 116 52228	680	R	0,5W
3041	4822 116 52228	680	R	0,5W
3042	4822 116 83883	470	R	0,5W
3046	4822 117 11449	2,2	k	0,1W
3047	4822 116 83884	47	k	0,5W
3048	4822 116 52234	100	k	0,5W
3059	4822 116 52256	2,2	k	0,5W
3060	4822 116 52195	47	R	0,5W
3061	4822 116 52228	680	R	0,5W
3062	4822 116 83864	10	k	0,5W
3063	4822 116 52226	560	R	0,5W
3064	4822 116 52226	560	R	0,5W
3065	4822 050 11002	1	k	0,4W
3066	4822 116 52256	2,2	k	0,5W
3067	4822 116 83881	390	R	0,5W
3068	4822 050 11002	1	k	0,4W
3069	4822 116 52231	820	R	0,5W
3070	4822 050 11002	1	k	0,4W
3071	4822 116 52219	330	R	0,5W
3072	4822 116 52269	3,3	k	0,5W
3073	4822 116 52207	1,2	k	0,5W
3074	4822 116 52256	2,2	k	0,5W
3075	4822 116 52283	4,7	k	0,5W
3076	4822 100 12157	10	k	
3077	4822 116 52303	8,2	k	0,5W
3078	4822 050 11002	1	k	0,4W
3079	4822 116 52256	2,2	k	0,5W
3080	4822 116 83864	10	k	0,5W
3081	4822 116 52243	1,5	k	0,5W
3082	4822 116 52251	18	k	0,5W
3083	4822 116 52283	4,7	k	0,5W
3084	4822 116 52256	2,2	k	0,5W
3085	4822 051 10102	1	k	0,25W
3086	4822 116 52271	33	k	0,5W
3087	4822 116 52256	2,2	k	0,5W
3088	4822 050 11002	1	k	0,4W
3089	4822 116 52249	1,8	k	0,5W
3090	4822 116 83864	10	k	0,5W
3091	4822 116 52283	4,7	k	0,5W
3092	4822 116 52283	4,7	k	0,5W
3093	4822 117 10833	10	k	0,1W
3094	4822 117 10833	10	k	0,1W
3095	4822 116 52175	100	R	0,5W
3096	4822 116 52175	100	R	0,5W

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3097	4822 116 52175	100	R	0,5W
3101	4822 051 20472	4,7	k	0,1W
3102	4822 051 20561	560	R	0,1W
3103	4822 051 20561	560	R	0,1W
3104	4822 051 20112	1,1	k	0,1W
3105	4822 051 20472	4,7	k	0,1W
3106	4822 051 20153	15	k	0,1W
3107	4822 051 20331	330	R	0,1W
3108	4822 051 20472	4,7	k	0,1W
3109	4822 051 20471	470	R	0,1W
3110	4822 051 20331	330	R	0,1W
3111	4822 051 20224	220	k	0,1W
3112	4822 117 10833	10	k	0,1W
3113	4822 051 20331	330	R	0,1W
3114	4822 117 12605	27	k	0,1W
3115	4822 051 20568	5,6	R	0,1W
3116	4822 117 11383	12	k	0,1W
3118	4822 100 12157	10	k	
3119	4822 117 11449	2,2	k	0,1W
3120	4822 051 10102	1	k	0,25W
3321	4822 116 83874	220	k	0,5W
3322	4822 116 52195	47	R	0,5W
3323	4822 117 10833	10	k	0,1W
3325	4822 051 20224	220	k	0,1W
3326	4822 116 83872	220	R	0,5W
3327	4822 116 83872	220	R	0,5W
3328	4822 050 11002	1	k	0,4W
3329	4822 116 83872	220	R	0,5W
3330	4822 116 52283	4,7	k	0,5W
3331	4822 116 52234	100	k	0,5W
3332	4822 117 10833	10	k	0,1W
3334	4822 117 10833	10	k	0,1W
3335	4822 051 20472	4,7	k	0,1W
3336	4822 116 83864	10	k	0,5W
3337	4822 051 20104	100	k	0,1W
3340	4822 050 11002	1	k	0,4W
3341	4822 051 20101	100	R	0,1W
3342	4822 116 52175	100	R	0,5W
3344	4822 116 52175	100	R	0,5W
3345	4822 116 83864	10	k	0,5W
3351	4822 116 52283	4,7	k	0,5W
3352	4822 050 11002	1	k	0,4W
3353	4822 050 11002	1	k	0,4W
3354	4822 117 10834	47	k	0,1W
3355	4822 116 83864	10	k	0,5W
3356	4822 050 11002	1	k	0,4W
3357	4822 116 83884	47	k	0,5W
3358	4822 050 11002	1	k	0,4W
3363	4822 116 83881	390	R	0,5W
3364	4822 116 52264	27	k	0,5W
3370	4822 050 11002	1	k	0,4W
3371 ▲	4822 052 10228	2,2	R	0,33W
3372	4822 051 20223	22	k	0,1W
3373	4822 051 20471	470	R	0,1W
3374	4822 117 11503	220	R	0.1W
3375	4822 117 10833	10	k	0,1W
3376	4822 051 20472	4,7	k	0,1W
3377	4822 116 80176	1	R	0,5W
3378	4822 117 10834	47	k	0,1W
3379	4822 051 20392	3,9	k	0,1W
3380	4822 116 83876	270	R	0,5W
3381	4822 116 52289	5,6	k	0,5W
3382	4822 117 10833	10	k	0,1W
3383	4822 116 83864	10	k	0,5W
3384	4822 116 52283	4,7	k	0,5W
3385	4822 051 20223	22	k	0,1W
3386	4822 116 52264	27	k	0,5W
3387	4822 117 11149	82	k	0,1W
3388	4822 051 20472	4,7	k	0,1W
3389	4822 116 52283	4,7	k	0,5W
3390	4822 051 20471	470	R	0,1W
3391	4822 051 20225	2,2	M	0,1W
3392	4822 051 20104	100	k	0,1W
3393	4822 051 20104	100	k	0,1W
3394	4822 117 10834	47	k	0,1W
3395	4822 116 52175	100	R	0,5W
3396	4822 116 52175	100	R	0,5W
3397	4822 051 20101	100	R	0,1W
3398	4822 051 20472	4,7	k	0,1W
3399	4822 116 52283	4,7	k	0,5W
3403	4822 051 20101	100	R	0,1W
3404	4822 051 20273	27	k	0,1W
3405	4822 117 11507	6,8	k	0,1W
3406	4822 051 20008	0	R	0,1W
3407	4822 051 20101	100	R	0,1W
3409	4822 117 11449	2,2	k	0,1W
3410	4822 117 11449	2,2	k	0,1W
3413	4822 116 52175	100	R	0,5W
3414	4822 116 52175	100	R	0,5W
3415	4822 117 11449	2,2	k	0,1W
3416	4822 117 11148	56	k	0,1W
3417	4822 116 52256	2,2	k	0,5W
3419	4822 117 11449	2,2	k	0,1W
3420	4822 116 52175	100	R	0,5W
3422	4822 117 10834	47	k	0,1W
3423	4822 051 20472	4,7	k	0,1W
3424	4822 116 52283	4,7	k	0,5W
3425	4822 051 20333	33	k	0,1W
3426 ▲	4822 052 10109	10	R	0,33W
3427	4822 117 11503	220	R	0.1W
3428	4822 050 11002	1	k	0,4W
3429	4822 117 10833	10	k	0,1W
3430	4822 051 10102	1	k	0,25W
3431 ▲	4822 052 10109	10	R	0,33W
3432	4822 116 83864	10	k	0,5W
3433	4822 116 52283	4,7	k	0,5W
3434	4822 116 83864	10	k	0,5W
3435	4822 051 20472	4,7	k	0,1W
3436	4822 116 52175	100	R	0,5W
3437	4822 116 52175	100	R	0,5W
3438	4822 117 10834	47	k	0,1W
3439	4822 116 52175	100	R	0,5W
3440	4822 117 10833	10	k	0,1W
3441	4822 116 52234	100	k	0,5W
3442	4822 116 83876	270	R	0,5W
3443	4822 116 83876	270	R	0,5W
3444	4822 116 83876	270	R	0,5W
3445	4822 116 83876	270	R	0,5W
3446	4822 117 10833	10	k	0,1W
3447	4822 116 52175	100	R	0,5W
3448	4822 116 52175	100	R	0,5W
3449	4822 117 10833	10	k	0,1W
3450	4822 117 10833	10	k	0,1W
3451	4822 117 10833	10	k	0,1W
3452	4822 051 10102	1	k	0,25W
3453	4822 116 83864	10	k	0,5W
3454	4822 117 11454	820	R	0,1W
3455	4822 117 10833	10	k	0,1W
3456	4822 116 83864	10	k	0,5W
3457	4822 051 20471	470	R	0,1W
3458	4822 051 10102	1	k	0,25W
3459	4822 117 10834	47	k	0,1W
3460	4822 051 20472	4,7	k	0,1W
3461	4822 117 11148	56	k	0,1W
3462	4822 051 20223	22	k	0,1W
3463	4822 051 20223	22	k	0,1W
3464	4822 117 10834	47	k	0,1W
3465	4822 050 11002	1	k	0,4W
3466	4822 116 52234	100	k	0,5W
3467	4822 116 52256	2,2	k	0,5W
3470	4822 116 83864	10	k	0,5W
3471	4822 050 11002	1	k	0,4W
3472	4822 117 11383	12	k	0,1W
3473	4822 116 52238	12	k	0,5W
3474	4822 116 52283	4,7	k	0,5W
3475	4822 051 20333	33	k	0,1W
3476	4822 117 10834	47	k	0,1W
3477	4822 117 10834	47	k	0,1W
3478	4822 117 10833	10	k	0,1W
3479	4822 116 52256	2,2	k	0,5W
3480	4822 050 11002	1	k	0,4W
3481	4822 116 83864	10	k	0,5W
3482	4822 116 83864	10	k	0,5W
3483	4822 116 83864	10	k	0,5W
3488	4822 051 10102	1	k	0,25W
3490	4822 051 20223	22	k	0,1W
3491	4822 116 83864	10	k	0,5W
3492	4822 116 83884	47	k	0,5W
3493	4822 116 52283	4,7	k	0,5W
3495	4822 116 52256	2,2	k	0,5W
3496	4822 117 11503	220	R	0.1W
3497	4822 117 10833	10	k	0,1W

▲... Safety component, use only this type

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3498	4822 117 10833	10	k	0,1W
3499	4822 116 52283	4,7	k	0,5W
3503	4822 116 83872	220	R	0,5W
3504	4822 051 20759	75	R	0,1W
3505	4822 051 20759	75	R	0,1W
3506	4822 116 83872	220	R	0,5W
3507	4822 117 11503	220	R	0.1W
3508	4822 116 83872	220	R	0,5W
3509	4822 117 11503	220	R	0.1W
3510	4822 116 83872	220	R	0,5W
3511	4822 051 20759	75	R	0,1W
3512	4822 116 83872	220	R	0,5W
3513	4822 117 11503	220	R	0.1W
3514	4822 117 11503	220	R	0.1W
3515	4822 117 11503	220	R	0.1W
3516	4822 117 11503	220	R	0.1W
3517	4822 116 83872	220	R	0,5W
3518	4822 051 20759	75	R	0,1W
3519	4822 116 52283	4,7	k	0,5W
3520	4822 117 10833	10	k	0,1W
3521	4822 117 11507	6,8	k	0,1W
3522	4822 117 11148	56	k	0,1W
3523	4822 116 83881	390	R	0,5W
3524	4822 116 52231	820	R	0,5W
3525	4822 116 52271	33	k	0,5W
3526	4822 116 83864	10	k	0,5W
3527	4822 116 83864	10	k	0,5W
3528	4822 116 52238	12	k	0,5W
3529	4822 116 52175	100	R	0,5W
3530	4822 116 52175	100	R	0,5W
3531	4822 116 83864	10	k	0,5W
3532	4822 116 83874	220	k	0,5W
3533	4822 051 20224	220	k	0,1W
3534	4822 116 83874	220	k	0,5W
3535	4822 051 20224	220	k	0,1W
3536	4822 116 83874	220	k	0,5W
3537	4822 116 83874	220	k	0,5W
3538	4822 117 11449	2,2	k	0,1W
3601	4822 116 83884	47	k	0,5W
3602	4822 051 20225	2,2	M	0,1W
3603	4822 051 20822	8,2	k	0,1W
3604	4822 116 52175	100	R	0,5W
3605	4822 116 52175	100	R	0,5W
3606	4822 117 10833	10	k	0,1W
3607	4822 117 11383	12	k	0,1W
3608	4822 117 10965	18	k	0,1W
3609	4822 051 20223	22	k	0,1W
3610	4822 051 20332	3,3	k	0,1W
3611	4822 116 52191	33	R	0,5W
3612	4822 117 11507	6,8	k	0,1W
3613	4822 051 20153	15	k	0,1W
3614	4822 116 52283	4,7	k	0,5W
3615	4822 051 20391	390	R	0,1W
3616	4822 051 20681	680	R	0,1W
3617	4822 117 10833	10	k	0,1W
3618	4822 051 20475	4,7	M	0,1W
3619	4822 051 20224	220	k	0,1W
3620	4822 116 52256	2,2	k	0,5W
3621	4822 051 20822	8,2	k	0,1W
3622	4822 116 52257	22	k	0,5W
3623	4822 117 11383	12	k	0,1W
3624	4822 117 10834	47	k	0,1W
3625	4822 117 11449	2,2	k	0,1W
3626	4822 100 12159	100	k	
3627	4822 117 11952	390	k	0,1W
3628	4822 117 10834	47	k	0,1W
3629	4822 117 11449	2,2	k	0,1W
3630	4822 051 20681	680	R	0,1W
3631	4822 116 52195	47	R	0,5W
3632	4822 051 20109	10	R	0,1W
3633	4822 051 20158	1,5	R	0,1W
3640	4822 116 52219	330	R	0,5W
3641	4822 117 10965	18	k	0,1W
3642	4822 116 52219	330	R	0,5W
3643	4822 051 20392	3,9	k	0,1W
3644	4822 051 20224	220	k	0,1W
3645	4822 051 20333	33	k	0,1W
3646	4822 051 20683	68	k	0,1W
3647	4822 051 20109	10	R	0,1W
3648	4822 051 20158	1,5	R	0,1W
3651	4822 116 83864	10	k	0,5W

3652	4822 117 12708	39, 1	k	
3653	4822 116 52175	100	R	0,5W
3654	4822 116 52175	100	R	0,5W
3655	4822 051 20683	68	k	0,1W
3656	4822 051 20562	5,6	k	
3657	4822 051 20683	68	k	0,1W
3658	4822 051 20562	5,6	k	
3659	4822 051 20104	100	k	0,1W
3660	4822 051 20104	100	k	0,1W
3661	4822 051 20104	100	k	0,1W
3662	4822 051 20104	100	k	0,1W
3663	4822 051 20475	4,7	M	0,1W
3664	4822 050 11002	1	k	0,4W
3701	4822 051 20333	33	k	0,1W
3702	4822 100 12157	10	k	
3703	4822 116 52251	18	k	0,5W
3704	4822 116 52251	18	k	0,5W
3705	4822 117 10834	47	k	0,1W
3706	4822 051 20472	4,7	k	0,1W
3707	4822 051 20472	4,7	k	0,1W
3708	4822 051 20391	390	R	0,1W
3709	4822 051 20472	4,7	k	0,1W
3710	4822 051 20104	100	k	0,1W
3711	4822 051 20562	5,6	k	
3711	4822 051 20472	4,7	k	0,1W
3712	4822 051 20101	100	R	0,1W
3714	4822 051 20101	100	R	0,1W
3715	4822 116 52175	100	R	0,5W
3716	4822 116 52256	2,2	k	0,5W
3717	4822 051 20223	22	k	0,1W
3718	4822 116 52249	1,8	k	0,5W
3719	4822 117 11454	820	R	0,1W not for PAL BG
3719	4822 051 10102	1	k	0,25W only for PAL BG
3720	4822 051 10102	1	k	0,25W
3721	4822 051 20562	5,6	k	
3722	4822 100 12158	22	k	
3724	4822 051 20331	330	R	0,1W
3724	4822 117 11504	270	R	0.1W
3725	4822 051 20154	150	k	0,1W
3726	4822 051 20331	330	R	0,1W
3727	4822 050 11002	1	k	0,4W
3728	4822 051 20471	470	R	0,1W
3728	4822 051 20391	390	R	0,1W
3729	4822 051 20391	390	R	0,1W
3730	4822 051 20471	470	R	0,1W only for PAL BG
3730	4822 051 20391	390	R	0,1W only for SECAM
3731	4822 051 20391	390	R	0,1W
3733	4822 051 20101	100	R	0,1W
3771	4822 116 52175	100	R	0,5W
3772	4822 051 20101	100	R	0,1W
3773	4822 051 20333	33	k	0,1W
3774	4822 051 20472	4,7	k	0,1W
3775	4822 051 20562	5,6	k	
3776	4822 051 20562	5,6	k	
3777	4822 116 83872	220	R	0,5W
3778	4822 116 83872	220	R	0,5W
3779	4822 116 83872	220	R	0,5W
3801	4822 117 12955	2,7	k	
3802	4822 117 12955	2,7	k	
3803	4822 051 20104	100	k	0,1W
3804	4822 116 83864	10	k	0,5W
3805	4822 116 52234	100	k	0,5W
3806	4822 116 52195	47	R	0,5W
3807	4822 116 52234	100	k	0,5W
3808	4822 116 52263	2,7	k	0,5W
3809	4822 117 11139	1,5	k	0,1W
3810	4822 051 20182	1,8	k	0,1W
3811	4822 116 52234	100	k	0,5W
3812	4822 116 52303	8,2	k	0,5W
3813	4822 116 52257	22	k	0,5W
3814	4822 116 52263	2,7	k	0,5W
3815	4822 051 20331	330	R	0,1W
3816	4822 116 52263	2,7	k	0,5W
3817	4822 100 12155	2,2	k	
3818	4822 116 52231	820	R	0,5W
3819	4822 117 10965	18	k	0,1W
3820	4822 117 10965	18	k	0,1W
3821	4822 116 52257	22	k	0,5W
3822	4822 051 20223	22	k	0,1W
3823	4822 051 20474	470	k	0,1W
3830	4822 051 20472	4,7	k	0,1W

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3831	4822 051 20104	100 k	0,1W
3832	4822 051 20223	22 k	0,1W
3833	4822 051 20153	15 k	0,1W
3834	4822 051 20472	4,7 k	0,1W
3835	4822 051 20472	4,7 k	0,1W
3836	4822 051 20472	4,7 k	0,1W
3837	4822 117 11449	2,2 k	0,1W
3838	4822 117 11449	2,2 k	0,1W
3839	4822 051 20106	10 M	0,1W
3840	4822 051 20106	10 M	0,1W
3841	4822 051 20333	33 k	0,1W
3842	4822 051 20333	33 k	0,1W
3843	4822 051 20333	33 k	0,1W
3844	4822 051 20333	33 k	0,1W
3845	4822 051 20333	33 k	0,1W
3846	4822 051 20333	33 k	0,1W
3849	4822 051 20104	100 k	0,1W
3851	4822 051 20683	68 k	0,1W
3852	4822 051 20332	3,3 k	0,1W
3853	4822 051 20332	3,3 k	0,1W
3854	4822 116 52195	47 R	0,5W
3855	4822 116 52195	47 R	0,5W
3856	4822 051 20274	270 k	0,1W
3857	4822 116 52175	100 R	0,5W
3858	4822 116 52175	100 R	0,5W
3859	4822 116 52195	47 R	0,5W
3863	4822 116 52195	47 R	0,5W
3867	4822 051 20101	100 R	0,1W
3868	4822 117 11449	2,2 k	0,1W
3869	4822 116 52231	820 R	0,5W
3870	4822 117 11454	820 R	0,1W
3881	4822 117 11454	820 R	0,1W
3882	4822 116 52231	820 R	0,5W
3883	4822 051 20474	470 k	0,1W
3884	4822 117 10839	130 k	0.1W
3885	4822 116 52285	470 k	0,5W
3886	4822 116 83864	10 k	0,5W

RESISTORS

4100	4822 051 20008	0R00 JUMP. (0805)
4101	4822 051 20008	0R00 JUMP. (0805)
4102	4822 051 20008	0R00 JUMP. (0805)
4103	4822 051 20008	0R00 JUMP. (0805)
4104	4822 051 20008	0R00 JUMP. (0805)
4105	4822 051 20008	0R00 JUMP. (0805)
4106	4822 051 20008	0R00 JUMP. (0805)
4107	4822 051 20008	0R00 JUMP. (0805)
4108	4822 051 20008	0R00 JUMP. (0805)
4110	4822 051 20008	0R00 JUMP. (0805)
4111	4822 051 20008	0R00 JUMP. (0805)
4452	4822 051 20008	0R00 JUMP. (0805)
4454	4822 051 20008	0R00 JUMP. (0805)
4481	4822 051 20008	0R00 JUMP. (0805)
4482	4822 051 20008	0R00 JUMP. (0805)
4485	4822 051 20008	0R00 JUMP. (0805)
4486	4822 051 20008	0R00 JUMP. (0805)
4487	4822 051 20008	0R00 JUMP. (0805)
4488	4822 051 20008	0R00 JUMP. (0805)
4489	4822 051 20008	0R00 JUMP. (0805)
4490	4822 051 20008	0R00 JUMP. (0805)
4491	4822 051 20008	0R00 JUMP. (0805)
4492	4822 051 20008	0R00 JUMP. (0805)
4493	4822 051 20008	0R00 JUMP. (0805)
4494	4822 051 20008	0R00 JUMP. (0805)
4496	4822 051 20008	0R00 JUMP. (0805)
4498	4822 051 20008	0R00 JUMP. (0805)
4501	4822 051 20008	0R00 JUMP. (0805)
4651	4822 051 20008	0R00 JUMP. (0805)
4652	4822 051 20008	0R00 JUMP. (0805)
4701	4822 051 20008	0R00 JUMP. (0805)
4702	4822 051 20008	0R00 JUMP. (0805)
4703	4822 051 20008	0R00 JUMP. (0805)
4704	4822 051 20008	0R00 JUMP. (0805)
4705	4822 051 20008	0R00 JUMP. (0805)
4711	4822 051 20008	0R00 JUMP. (0805)
4712	4822 051 20008	0R00 JUMP. (0805)
4722	4822 051 20008	0R00 JUMP. (0805)
4723	4822 051 20008	0R00 JUMP. (0805)
4724	4822 051 20008	0R00 JUMP. (0805)
4771	4822 051 20008	0R00 JUMP. (0805)
4772	4822 051 20008	0R00 JUMP. (0805)
4911	4822 051 20008	0R00 JUMP. (0805)
4912	4822 051 20008	0R00 JUMP. (0805)
4914	4822 051 20008	0R00 JUMP. (0805)
4915	4822 051 20008	0R00 JUMP. (0805)
4916	4822 051 20101	100R00 5% 0,1W

COILS

5001	4822 157 51462	10UH
5002	4822 157 11145	150UH 5%
5003	4822 157 51462	10UH
5004	4822 157 11149	56UH 5%
5005	4822 157 11142	47UH 5%
5006	4822 157 10972	15UH 5%
5008	4822 157 11706	10UH 5% 2,4X3,4
5009	4822 157 11228	LAN02TB101J
5010	4822 157 11139	6,8UH 5%
5061	4822 157 63661	FIL LC VAR 4M286 5VS
5062	4822 157 11149	56UH 5%
5063	4822 157 11145	150UH 5%
5064	4822 157 63661	FIL LC VAR 4M286 5VS
5065	4822 157 11145	150UH 5%
5066	4822 157 10972	15UH 5%
5067	4822 157 11738	330UH 5% 5X3
5068	4822 157 11145	150UH 5%
5069	4822 157 11228	LAN02TB101J
5070	4822 157 63659	FIL LC VAR 1G072 5V2
5071	4822 157 10972	15UH 5%
5072	4822 157 10972	15UH 5%
5073	4822 157 10972	15UH 5%
5100	4822 157 11733	22UH 5% 5X3
5101	4822 157 50961	22 μH
5322	4822 157 50961	22 μH
5323	4822 157 53941	COIL 100MUH PM10
5451	4822 157 11706	10UH 5% 2,4X3,4
5452	4822 157 11706	10UH 5% 2,4X3,4
5453	4822 157 11706	10UH 5% 2,4X3,4
5454	4822 157 60147	2,2UH
5455	4822 157 71206	BLM21A601SPT
5456	4822 157 71206	BLM21A601SPT
5457	4822 157 71206	BLM21A601SPT
5471	4822 157 11734	0,33UH 10% 2,4X3,4
5501	4822 157 11139	6,8UH 5%
5601	4822 157 70038	10000UH 5% 6,8X11
5602	4822 157 53531	COIL ASSY
5641	4822 157 53531	COIL ASSY
5701	4822 157 71206	BLM21A601SPT
5702	4822 157 70877	H292ONS-6785NK
5703	4822 157 11231	LAN02TB1R0J
5704	4822 157 70877	H292ONS-6785NK
5705	4822 157 11733	22UH 5% 5X3
5706	4822 157 11706	10UH 5% 2,4X3,4
5708	4822 157 10972	15UH 5%
5771	4822 157 70038	10000UH 5% 6,8X11
5772	4822 157 71206	BLM21A601SPT
5801	4822 157 11706	10UH 5% 2,4X3,4
5802	4822 157 11706	10UH 5% 2,4X3,4
5803	4822 157 71206	BLM21A601SPT
5804	4822 157 71206	BLM21A601SPT
5805	4822 157 71206	BLM21A601SPT
5806	4822 157 71206	BLM21A601SPT
5807	4822 157 71206	BLM21A601SPT
5851	4822 157 11706	10UH 5% 2,4X3,4
5852	4822 157 11706	10UH 5% 2,4X3,4
5853	4822 157 11706	10UH 5% 2,4X3,4
5854	4822 157 10972	15UH 5%
5856	4822 157 11139	6,8UH 5%

DIODES

6061	4822 130 32778	1SS133
6401	4822 130 31983	BAT85
6460	4822 130 10231	SET:2X SENS + 1X LED
6460	4822 130 10231	SET:2X SENS + 1X LED
6502	4822 130 34197	BZX79-B12
6503	4822 130 80318	MTZ6.8C
6504	4822 130 34197	BZX79-B12
6505	4822 130 34197	BZX79-B12

Motherboard

6506	4822 130 34197	BZX79-B12
6507	4822 130 34197	BZX79-B12
6508	4822 130 34197	BZX79-B12
6601	4822 130 30861	BZX79-B7V5
6701	4822 130 10414	BA792
6702	4822 130 10414	BA792

TRANSISTORS & IC's

7001	4822 130 60511	BC847B
7002	4822 130 60511	BC847B
7003	4822 209 15526	LC89980M
7004	5322 130 60508	BC857B
7005	4822 209 16883	LA71527M
7006	4822 130 60511	BC847B
7007	4822 130 10872	MMUN2112L
7008	4822 130 60511	BC847B
7009	4822 130 60511	BC847B
7010	5322 130 42718	BFS20
7011	5322 130 42718	BFS20
7014	4822 130 60511	BC847B
7015	5322 130 60508	BC857B
7016	4822 130 60511	BC847B
7061	4822 130 60511	BC847B
7062	4822 209 73852	PMBT2369
7063	4822 130 60511	BC847B
7064	4822 130 63732	MMUN2212
7065	5322 130 60508	BC857B
7066	4822 209 90189	TDA4722/V2
7067	4822 130 60511	BC847B
7068	5322 130 60508	BC857B
7091	5322 209 11306	HEF4094BT
7092	4822 130 63732	MMUN2212
7101	4822 130 60511	BC847B
7102	4822 130 60511	BC847B
7103	4822 209 15548	STV5744AD
7104	4822 209 90421	STV5712
7105	4822 130 10872	MMUN2112L
7106	4822 130 10872	MMUN2112L
7107	4822 130 63732	MMUN2212
7322	4822 130 10802	BSH101
7323	4822 130 10214	STD17N06
7324	4822 130 60511	BC847B
7325	4822 130 41344	BC337-40
7326	4822 130 41327	BC327-40
7327	5322 130 60508	BC857B
7328	4822 130 60511	BC847B
7329	4822 130 60511	BC847B
7330	4822 130 10802	BSH101
7401	4822 209 16954	ST24E16M6-22RC548/00
7404	4822 130 60511	BC847B
7406	4822 209 16884	Deck/Control µP
7407	4822 130 41344	BC337-40
7408	5322 130 60508	BC857B
7412	4822 130 10872	MMUN2112L
7413	4822 130 60511	BC847B
7414	4822 130 60511	BC847B
7415	4822 130 60511	BC847B
7440	4822 209 30146	L2722
7441	4822 130 10872	MMUN2112L
7442	4822 130 60511	BC847B
7443	4822 209 30836	SAA1310/N2
7446	4822 209 13126	TDA5241
7451	4822 209 16854	EPROM ACOP5
7452	4822 209 16946	CY62256LL-70PC
7461	4822 130 10231	SET:2X SENS + 1X LED
7462	4822 130 10231	SET:2X SENS + 1X LED
7464	4822 130 10233	TCRT5000L
7465	4822 130 10233	TCRT5000L
7466	4822 130 10234	TCST1030L
7502	4822 130 42615	BC817-40
7504	4822 130 60511	BC847B
7505	4822 130 63732	MMUN2212
7506	4822 209 16886	STV6401
7508	4822 130 63732	MMUN2212
7603	4822 130 60373	BC856B
7604	4822 130 41327	BC327-40
7605	5322 130 60159	BC846B
7606	5322 130 60159	BC846B
7607	4822 130 60511	BC847B
7608	4822 130 42615	BC817-40
7641	5322 130 60508	BC857B
7642	4822 130 60511	BC847B
7643	4822 130 42615	BC817-40
7651	4822 209 16887	TDA9616H/N1
7701	4822 130 63732	MMUN2212
7703	4822 130 60511	BC847B
7704	4822 130 60511	BC847B
7705	4822 209 90452	TDA9814T/V3 for SECAM L
7705	4822 209 90431	TDA9813T/V2 not for SECAM L
7706	5322 130 60508	BC857B
7707	5322 130 42755	BC847C
7708	4822 209 60792	74HC4053D
7709	4822 130 60511	BC847B
7771	4822 209 32501	TDA9840T/V2
7801	5322 130 42718	BFS20
7802	5322 130 60508	BC857B
7803	4822 209 60177	LM339D
7804	5322 130 42718	BFS20
7805	4822 130 10872	MMUN2112L
7806	4822 130 10872	MMUN2112L
7807	4822 209 16888	TA1225N
7830	4822 209 80631	LM339N-00
7831	4822 130 60511	BC847B
7832	4822 130 60511	BC847B
7851	4822 209 16889	SDA5652P
7854	5322 130 60508	BC857B
7855	4822 130 60511	BC847B
7856	5322 130 60508	BC857B
7857	4822 209 63604	BA7046F

Connector PCB ACP3, CABLES & SUB MODULS

3580	4822 051 20104	100 k	0,1W
3581	4822 117 10833	10 k	0,1W
3582	4822 051 20229	22 R	0,1W
3583	4822 051 20153	15 k	0,1W
3584	4822 051 20153	15 k	0,1W
3585	4822 051 20474	470 k	0,1W
3586	4822 117 11149	82 k	0,1W
3587	4822 051 20472	4,7 k	0,1W
3588	4822 117 11503	220 R	0.1W

RESISTORS

4500	4822 051 20008	0R00 JUMP. (0805)
4501	4822 051 20008	0R00 JUMP. (0805)
4502	4822 051 20008	0R00 JUMP. (0805)
4503	4822 051 20008	0R00 JUMP. (0805)
4504	4822 051 20008	0R00 JUMP. (0805)
4505	4822 051 20008	0R00 JUMP. (0805)
4506	4822 051 20008	0R00 JUMP. (0805)
4507	4822 051 20008	0R00 JUMP. (0805)

COILS

5551	4822 157 11145	150UH 5%
5552	4822 157 11228	LAN02TB101J
5553	4822 157 11145	150UH 5%
5555	4822 157 11139	6,8UH 5%
5556	4822 157 11145	150UH 5%
5557	4822 157 11739	220UH 5% 2,4X3,4

DIODES

6551	4822 130 34197	BZX79-B12
6552	4822 130 34197	BZX79-B12
6553	4822 130 34278	BZX79-B6V8
6554	4822 130 34278	BZX79-B6V8
6555	4822 130 83757	BAS216
6556	4822 130 83757	BAS216
6557	4822 130 34278	BZX79-B6V8
6558	4822 130 34278	BZX79-B6V8
6559	4822 130 34197	BZX79-B12
6560	4822 130 34197	BZX79-B12

TRANSISTORS & IC's

7520	4822 209 16193	TDA7053AT
7551	5322 130 42755	BC847C
7552	5322 130 42755	BC847C
7553	4822 130 41096	BC550C
7554	4822 130 41096	BC550C

CABLES

	4822 320 50377	ANTENNA cable
	4822 321 63002	SCART cable
▲	4822 321 10249	SBC1201 MAINS CABLE
▲	4822 321 10886	MAINS CABLE UK
	4822 320 50377	CONNECT. CABLE PAL
	4822 321 63002	SCART CABLE(PROJ.50)
	4822 321 62401	AUDIO-CABLE
8001	4822 320 11889	FFC TD1-1961
8003	4822 320 12453	FFC 3POL TD3-1947
8004	4822 320 12454	FFC 6POL TD4-1948
8011	4822 320 12455	FFC 7POL 1982-1956
8012	4822 320 12453	FFC 3POL TD3-1947
8013	4822 320 12461	FFC 1961-1102
8014	4822 320 12456	FFC 3POL 1929-1922
8015	4822 320 12457	FFC 4POL 1925-1921
8018	4822 320 12458	FFC 17POL 1915-1942
8020	4822 320 12459	FFC 14POL 1944-1920

SUB MODULES

1972	4822 214 12236	QNIC

REPAIR KITS

4822 310 11237	POWER SUPPLY REPAIR KIT

▲... Safety component, use only this type